ORDER NO. HAD 8802022C0
A6

Service Manual

Compact Disc Player

SL-P350

Color

(S) .... Silver Type
(K) .... Black Type

Area

Color	Area
(K)	(M) ..... U.S.A.
(K)	(MC) ..... Canada.
(S)(K)	(E) ..... Continental Europe.
(S)(K)	(Ei) ..... Italy.
(S)(K)	(EG) ..... F.R. Germany.
(S)(K)	(EK) ..... United Kingdom.
(S)(K)	(EB) ..... Belgium.
(S)(K)	(EF) ..... France.
(S)(K)	(EH) ..... Holland.
(K)	(XL) ..... Australia.
(K)	(XA) ..... Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB) ..... Saudi Arabia.
(K)	(PA) ..... Far East PX.
(K)	(PE) ..... European Military.
(K)	(PC) ..... European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right stereo)
Frequency response	2–20,000 Hz±0.3 dB
Output voltage	2 V (at 0 dB)
Dynamic range	96 dB
S/N ratio	103 dB
Harmonic distortion	0.003% (1 kHz, 0 dB)
Total harmonic distortion	0.005% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
Low-pass filter	High Resolution Digital Filter with 4 times over-sampling (175.4 kHz)
Output impedance	Approx. 600Ω
Load impedance	More than 10 kΩ
Headphone output level	15 mW max. 32Ω (adjustable)
D-A conversion system	2 DAC System with 16 bit Resolution

■ Signal Format

Sampling frequency	44.1 kHz

■ Pickup

Wavelength	780 nm

■ Infrared remote-control transmitter

Dimensions (W×H×D)	61×19×165 mm ($2^{13}/_{32}$″×¾″×6½″)
Batteries	UM-4 "AA" batteries or IEC R03 or equivalent (1.5 V×2)
Weight	105 g (3.7 oz) (including batteries)

■ General

Power supply	
For U.S.A. and Canada:	AC 60 Hz, 120 V
For Continental Europe:	AC 50 Hz, 220 V
For United Kingdom:	AC 50 Hz, 240 V
For Australia:	AC 50 Hz, 240 V
For others:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Power consumption	15 W
Dimensions (W×H×D)	430×91×274 mm ($16^{15}/_{16}$″×$3^{19}/_{32}$″×$10^{25}/_{32}$″)
Weight	3.7 kg (8.2 lb)

Specifications are subject to change without notice.
Weight and dimensions shown are approximate.
Measured by EIAJ (CP-307).

Technics

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SL-P350

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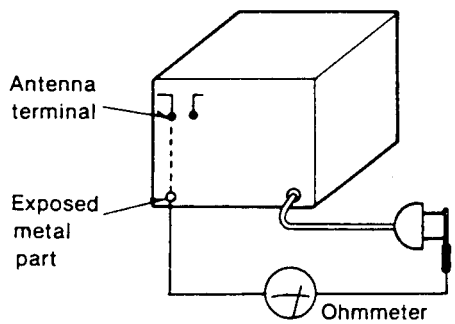
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

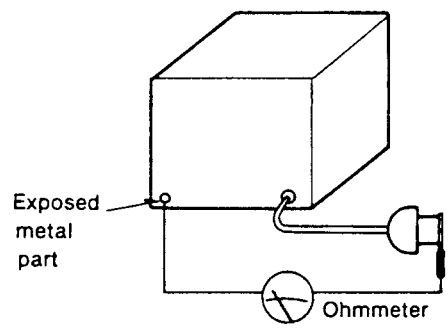
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



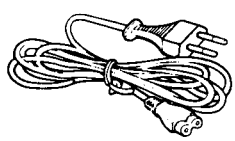
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ ACCESSORIES

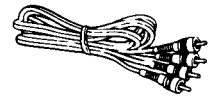
• **AC power supply cord** 1



SJA168-1 [XA]
SJA173 [XL]
SJA175-1 [M]
SJA175 [MC]
SFDAC05G02 [EK]
SJA183 [XB]
SJA187 other

• **Stereo connection cable** 1

SJP2249-1

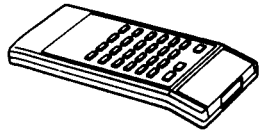


• **Coaxial cable** 1

SJPD19

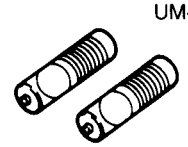
• **Remote-control transmitter**..... 1

Black version: EUR64781...[M] and [MC] areas
EUR64782...Other areas
Silver version: EUR64783



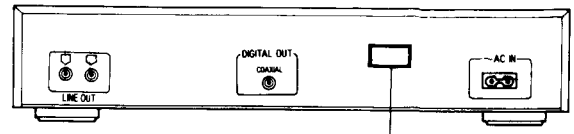
• **Batteries** 2

UM-4 or IECR03



■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

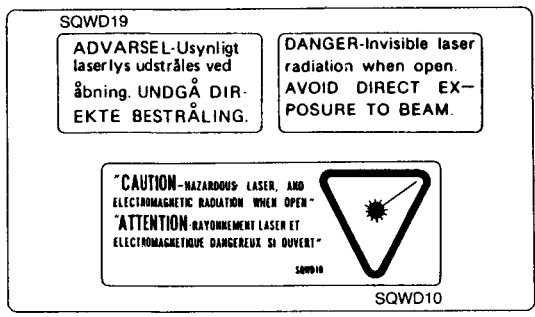


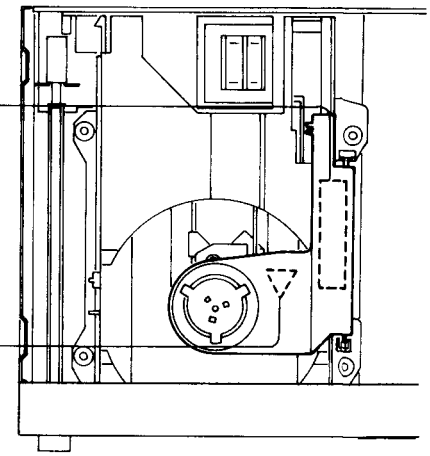
SQWD7

Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	SQWD45	SQWD10	SQWD7	SQWD19
[MC]	×	○	×	×
[E]	○	×	○	○
[EK], [XL], [EG], [EB], [EH], [EF], [Ei], [XB], [XA]	○	×	○	○


SQWD19
ADVARSEL-Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD10



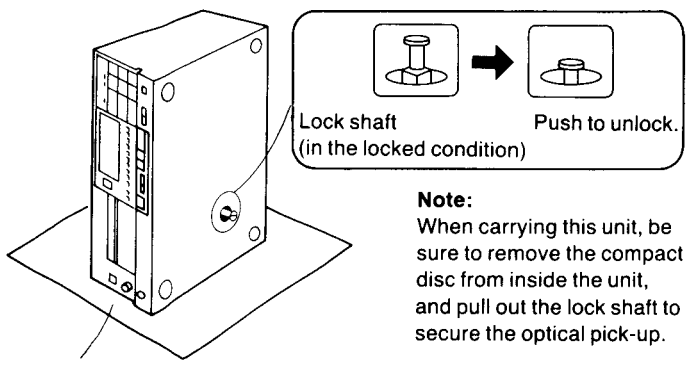
SQWD45

VAROITUS! Laite sisältää laserdiodin,
joka lähettää näkymätöntä silmille
vaarallista lasersäteilya

■ BEFORE USING THIS UNIT

Before placement

The optical pick-up is secured to prevent damage during transport. Be sure to release it before use.



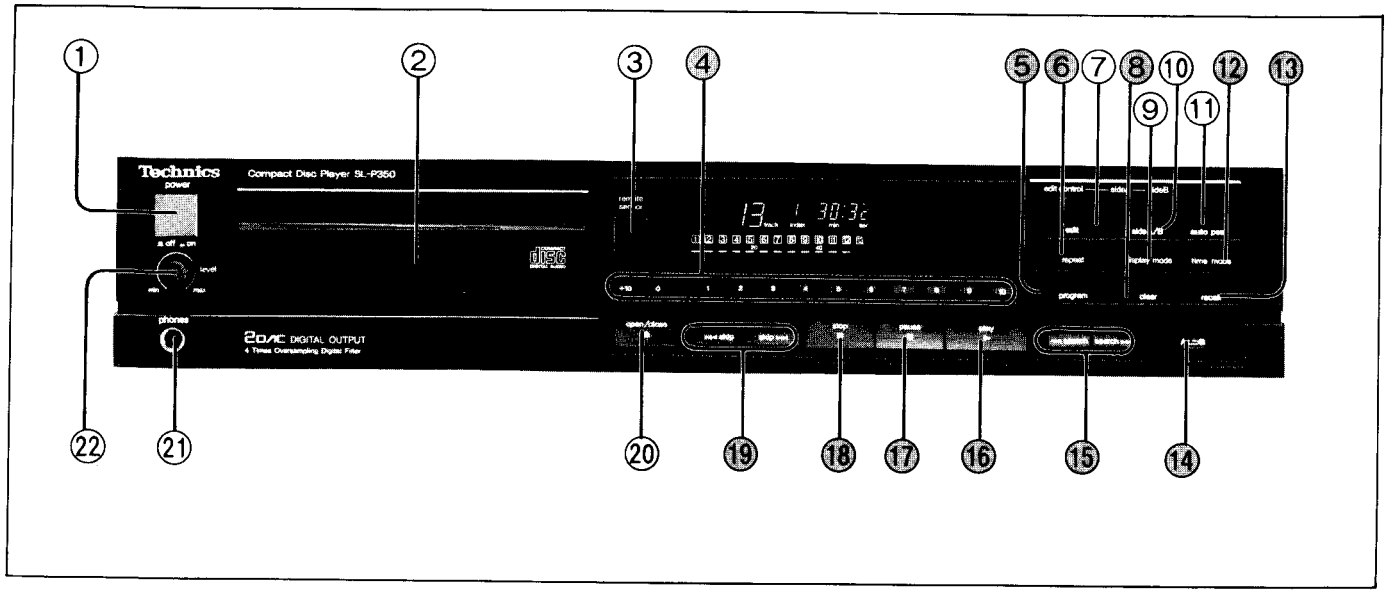
Soft cloth or similar material (to prevent scratches)

Note:
When carrying this unit, be sure to remove the compact disc from inside the unit, and pull out the lock shaft to secure the optical pick-up.

Notes of placement

- **Place on a flat, level surface so that the front-rear inclination does not exceed 5°.**
- **Avoid places such as the following:**
  - Near any equipment or device that generates strong magnetism.
  - On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
  - Extremely cold places (5°C or below).
  - Near a tuner or TV (It may cause noise in the broadcast, or disturbance of the TV picture.)
- **Do not place heavy objects, other than system components, on top of the unit.**
- **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
  Always remove the disc before storing the unit for any period of time.
- **To avoid problems due to vibration.**
  - Do not place a book or similar object under this unit.
  - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ FLONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power switch (power)

② Disc holder

③ Remote-control signal receptor (remote sensor)

④ Numeric buttons (+10, 0, 1~10)

These buttons can be used to select the track numbers and the recording time.

⑤ Programmed-play button (program)

⑥ Repeat button (repeat)

⑦ Compact-disc edit button (edit)

When compact-disc sounds are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on the two sides of the tape, considering the length of the cassette tape used, so that there is no interruption of tracks.

⑧ Clear button (clear)

⑨ Display-mode select button (display mode)

This button can be used to select, each time it is pressed, either the display of the play position of the disc, or the display of the output level, by the indicator.

⑩ Tape-side select button (side A/B)

⑪ Peak-level search button (auto peak)

This button can be used to locate the maximum signal level (peak level) for the signals on the disc. This is a convenient feature that helps when adjusting the recording level when compact-disc sounds are to be recorded to tape.

⑫ Time-mode select button (time mode)

⑬ Recall button (recall)

⑭ A-B repeat button (A⮌B)

⑮ Search buttons (◀◀ search/search ▶▶)

These buttons can be used to locate a desired part of the disc at high speed (forward or reverse) during disc play. (The search speed is slow when the button is first pressed, and becomes faster if the button is pressed and held continuously.)

⑯ Play button (play/▶)

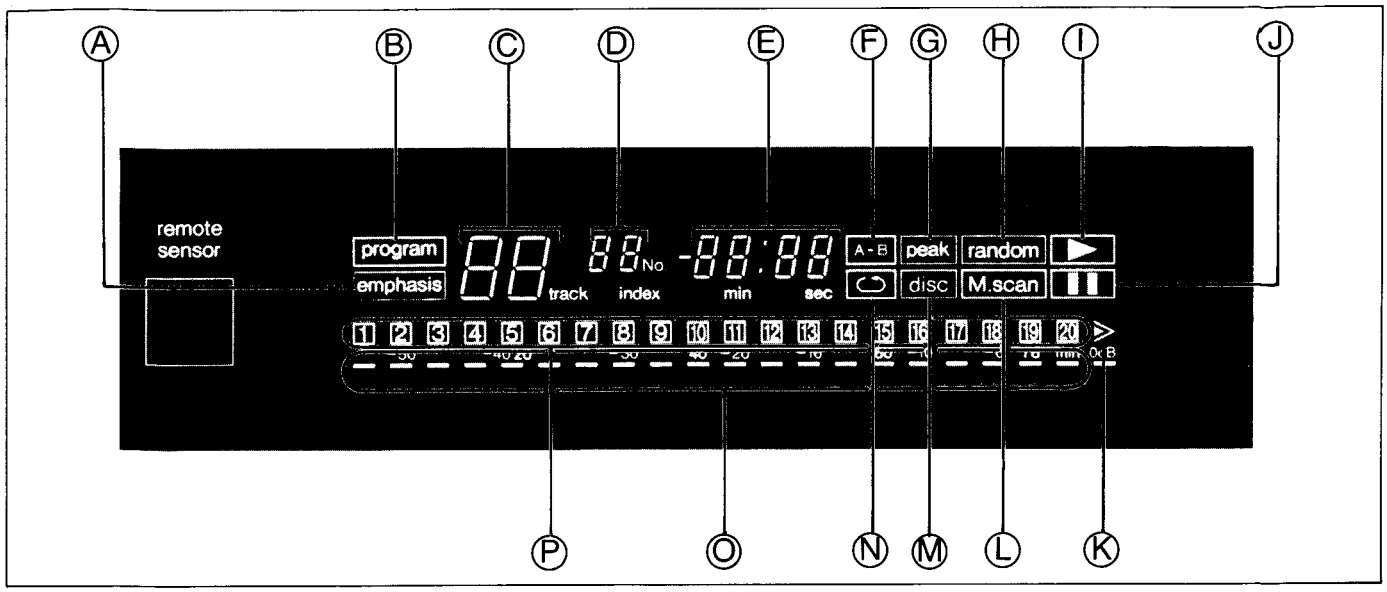
⑰ Pause button (pause/❚❚)

⑱ Stop button (stop/■)

This button can be used to stop the disc play, as well as to cancel the various play modes.

⑲ Skip buttons (⏮ skip/skip ⏭)

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.



⑳ Disc holder open/close button (open/close/⏏)

㉑ Headphones jack (phones)

㉒ Headphones volume control (level)

Indicators section

Ⓐ Emphasis indicator (emphasis)

The sounds on some compact discs are sounds that are re-recordings (as digital signals) of a sound source originally recorded as analog signals.
For some discs of this type, the signal characteristics have been corrected (emphasized), and this indicator illuminates when such discs are loaded in this unit.
For such discs, the output level will be displayed as slightly higher than for analog signals.

Ⓑ Programmed-play indicator (program)

Ⓒ Track number display (track)

Ⓓ Index-number display (No./index)

This display shows the index number as well as the sequence of programmed play.

Ⓔ Time display (min./sec.)

Ⓕ A-B repeat indicator (A-B)

Ⓖ Peak-level search indicator (peak)

Ⓗ Random-play indicator (random)

Ⓘ Play indicator (▶)

Ⓙ Pause indicator (❚❚)

Ⓚ "Over" mark (▶▶)

The "▶▶" indicator illuminates if the total number of tracks on the disc is 21 tracks or more.
When the play reaches the 21st track and thereafter, the "▶▶" begins flashing.

Ⓛ Music scan indicator (M.scan)

Ⓜ Disc indicator (disc)

This indicator illuminates when a disc is loaded.

Ⓝ Repeat indicator (↻)

Ⓞ Play-position/digital output-level indicator

Ⓟ Music matrix (1~20)

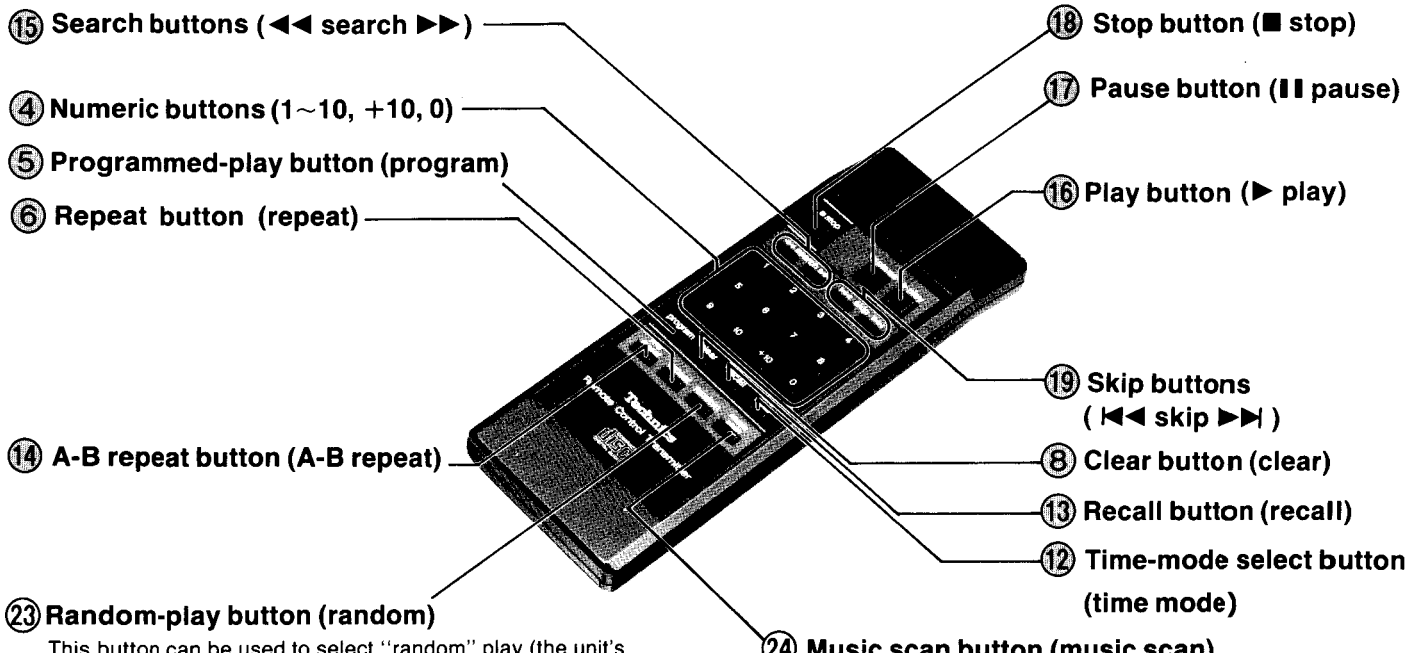
The numbers of the tracks on the disc are displayed up to a maximum of 20.

■ REMOTE CONTROL TRANSMITTER

Black version: EUR64781...[M] and [MC] areas
EUR64782...Other areas
Silver version: EUR64783

Control names

The functions indicated by the shaded frames can also be activated by using buttons on the unit. Refer to pages 4~5 about controls functions.


⑮ Search buttons (◀◀ search ▶▶)
④ Numeric buttons (1~10, +10, 0)
⑤ Programmed-play button (program)
⑥ Repeat button (repeat)
⑭ A-B repeat button (A-B repeat)
⑱ Stop button (■ stop)
⑰ Pause button (❚❚ pause)
⑯ Play button (▶ play)
⑲ Skip buttons (⏮ skip ⏭)
⑧ Clear button (clear)
⑬ Recall button (recall)
⑫ Time-mode select button (time mode)

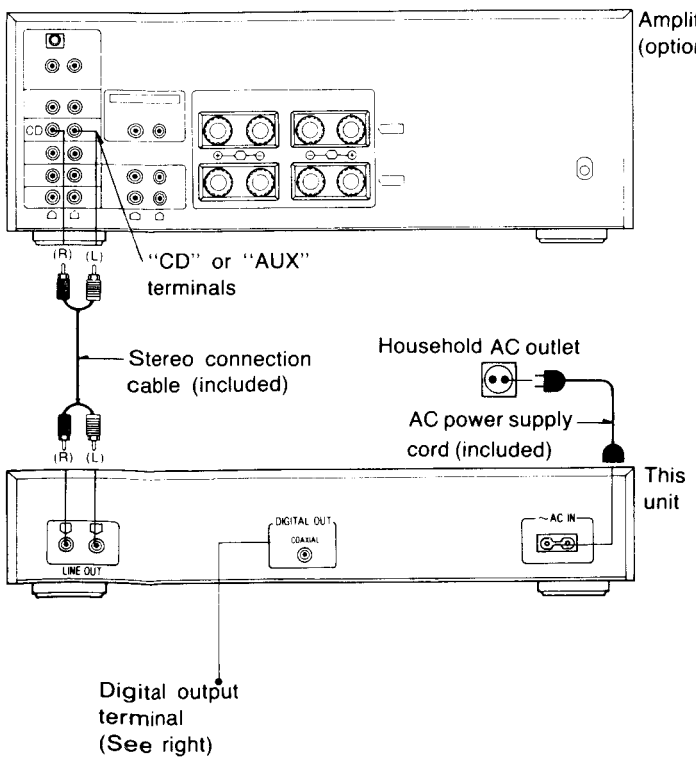
㉓ Random-play button (random)

This button can be used to select "random" play (the unit's microcomputer selects the sequence of track play in a random order). (For the remote-control transmitter only.)

㉔ Music scan button (music scan)

This button can be used to play the first part of each track in order.(For the remote-control transmitter only.)

■ CONNECTIONS



Note:
The configuration of the AC outlet and AC power supply cord differs according to area.

Digital output terminal (DIGITAL OUT)

The output signals of this unit are output from this terminal as digital signals.

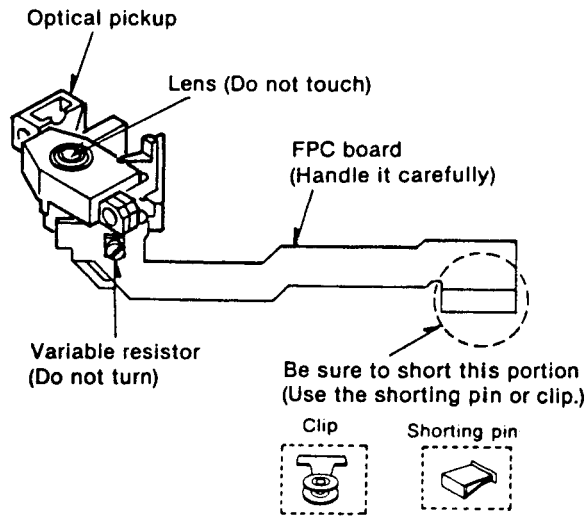
•Coaxial terminal (COAXIAL)
This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using a coaxial cable (included).

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

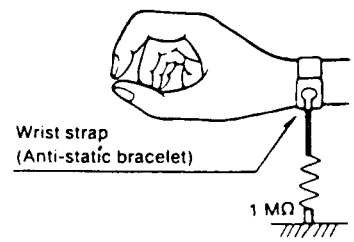
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (FPC board)
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. (FPC board)
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

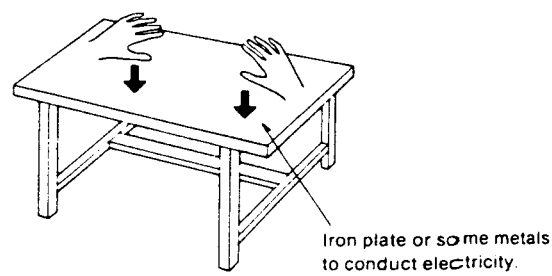


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



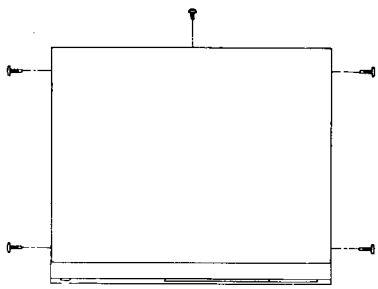


■ DISASSEMBLY INSTRUCTIONS

CAUTION:

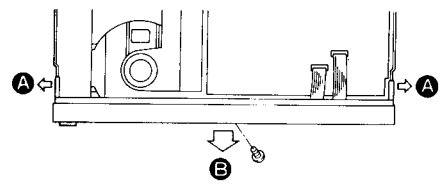
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 5 screws.

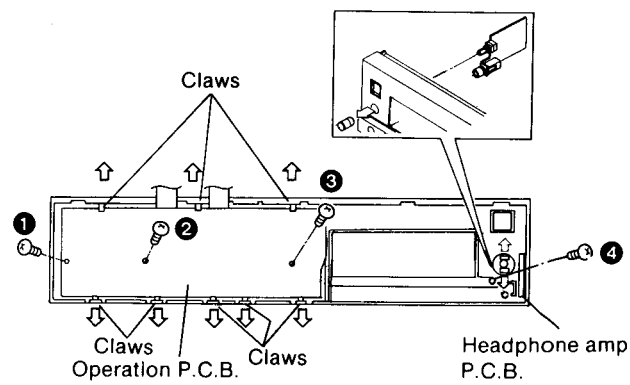


Note: When servicing, lock the lock shaft at the bottom of the unit. (See page 3.)

Ref. No. 2	How to remove the front panel
Procedure 1 ➧ 2	1. Remove the screw. 2. Slightly pull the tabs outwards (arrows Ⓐ). 3. Remove the front panel in the direction of the arrow Ⓑ.



Ref. No. 3	How to remove the operation P.C.B. and headphone amp. P.C.B.
Procedure 1 ➧ 2 ➧ 3	**A. Operation P.C.B.** 1. Remove the 3 screws (❶~❸). 2. Release the 8 claws. **B. Headphone amp. P.C.B.** 1. Pull out the level control knob. 2. Remove the screw ❹. 3. Release the 2 claws.

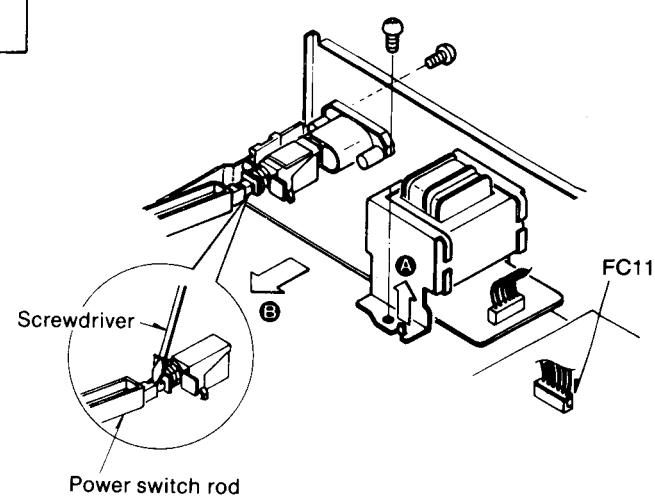


Ref. No. 4	How to remove the power transformer
Procedure 1 ➧ 2 ➧ 4	

1. Remove the connector (FC11).
2. Remove the 2 screws.
3. Lift the power transformer to remove it from the chassis tab (arrow Ⓐ).
4. Remove the power source P.C.B. in the direction of arrow Ⓑ.

- **How to remove the power switch rod**

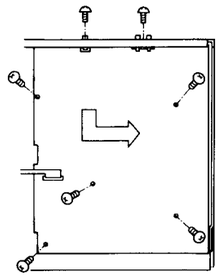
1. Set the power switch in the "OFF" position.
2. Remove the power switch rod by using a screwdriver.

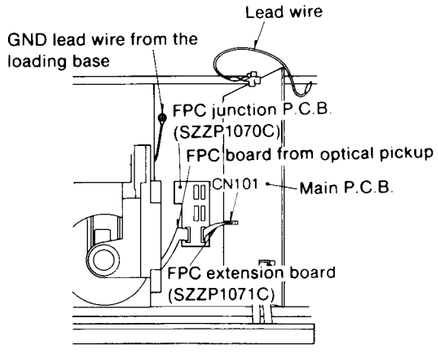


Ref. No. 5 — How to remove the main P.C.B.

Procedure 1 ♦ 5

1. Remove the 7 screws.
2. Lift the P.C.B. to remove it from the chassis tab.
3. Remove the P.C.B. in the direction of the arrow.

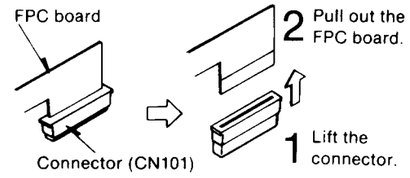




How to check the main P.C.B.

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B.
2. Remove the FPC board (CN101).



Caution: Insert the shorting pin into the FPC board in order to prevent breakdown of laser diode. (See page 7.)

3. Connect FPC board from optical pickup to FPC junction P.C.B. (SZZP1070C).

Caution: Cover the foil of the FPC junction P.C.B. with friction tape to prevent a short-circuit between the foil and the chassis.

4. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN101 of the main P.C.B.
5. Place the main P.C.B. as shown in the figure.

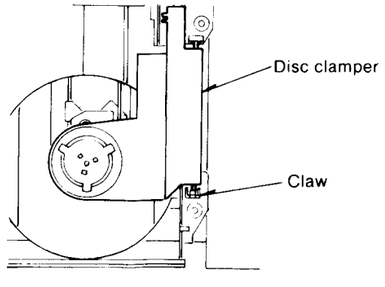
Cautions:

- Be sure to connect the P.C.B. ground terminal (line out terminal) and the chassis with a lead wire.
- Be sure to connect the GND lead wire from the loading base to the chassis.

Ref. No. 6 — How to remove the disc clamper

Procedure 1 ♦ 6

- Release the claw.

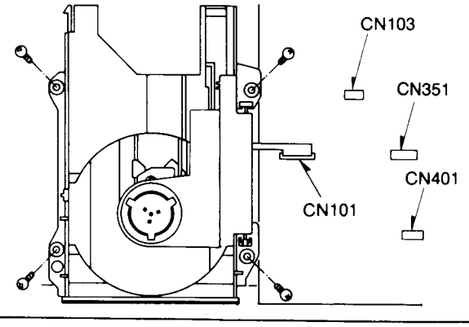


Ref. No. 7 — How to remove the loading base

Procedure 1 ♦ 2 ♦ 7

1. Pull out the 3 connectors (CN103, CN351 and CN401).
2. Remove the FPC board (CN101).
3. Remove the 4 screws.

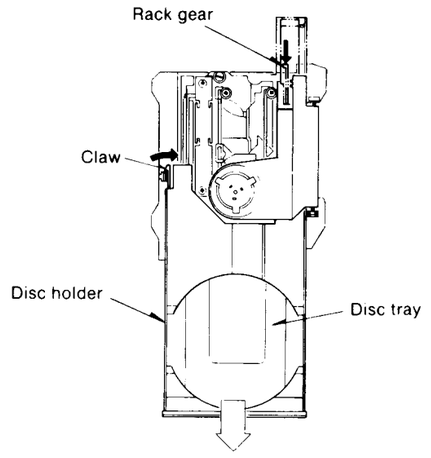
Refer to "HANDLING PRECAUTIONS FOR OPTICAL PICKUP" on page 7.



Ref. No. 8 — How to remove the disc holder

Procedure 1 ♦ 2 ♦ 8

1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up.
2. Pull the disc holder until it stops.
3. Release the claw.
4. Pull out the disc holder further to remove it.

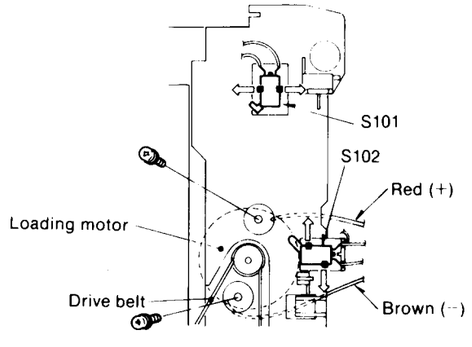


Ref. No. 9 — How to remove the loading motor

Procedure 1 ♦ 2 ♦ 7 ♦ 8 ♦ 9

1. Remote the drive belt.
2. Remove the 2 screws.

Note:
Red lead wire.....(+) terminal
(close to the slit of the motor)
Brown lead wire.....(–) terminal



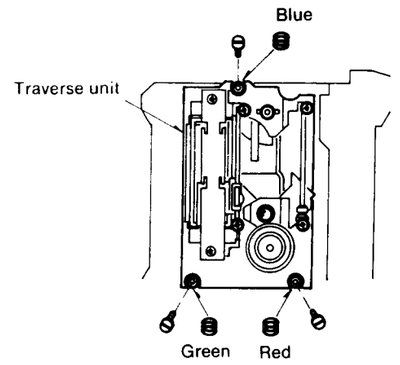
How to remove the switches (S101, S102)

- Release the claws.
- Note the fitting direction before remove it.

Ref. No. 10 — How to remove the traverse unit

Procedure 1 ♦ 2 ♦ 6 ♦ 7 ♦ 8 ♦ 10

- Remove the 3 screws.



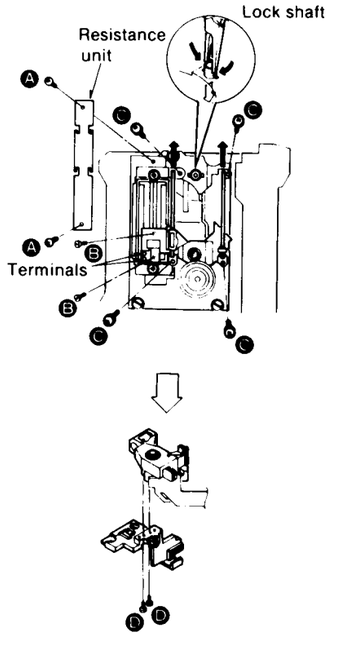
Caution: Note the color of the 3 springs, they must be remstalled to their original positions.

Ref. No. 11 — How to remove the optical pickup

Procedure 1 ♦ 2 ♦ 6 ♦ 7 ♦ 8 ♦ 11

Caution:
Refer to "Handling precautions for optical pickup" on page 7.

1. Remove the 2 screws Ⓐ and the resistance unit.
2. Unsolder the 2 terminals and 2 screws Ⓑ.
3. Release the claws by using pliers to remove the lock shaft.
4. Remove the 4 screws Ⓒ.
5. Pull out the optical pickup from the 2 guide shafts.
6. Remove the 2 screws Ⓓ to separate the holder from the optical pickup.



Ref. No. 12	How to remove the spindle motor
Procedure 1 ♦ 6 ♦ 7 ♦ 8 ♦ 12	

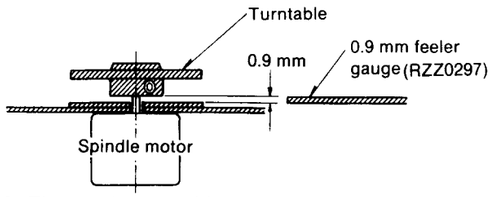
1. Loosen the screw ❶ by using a 1.27 mm hexagonal wrench and remove the turntable.
2. Remove the 2 screws (❷, ❸).

Caution:

1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+) terminal of the spindle motor is indicated by the red mark.

Adjustment of turntable height

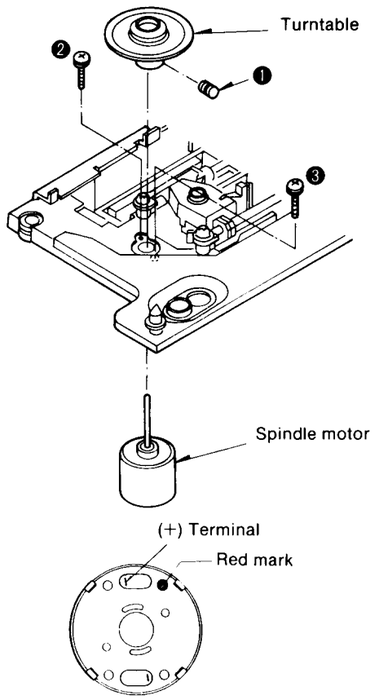
1. Insert a 0.9 mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.



2. Tighten the turntable set-screw by using a 1.27 mm hexagonal wrench.

Caution:

Refer to optical pickup adjustment (see page 17).



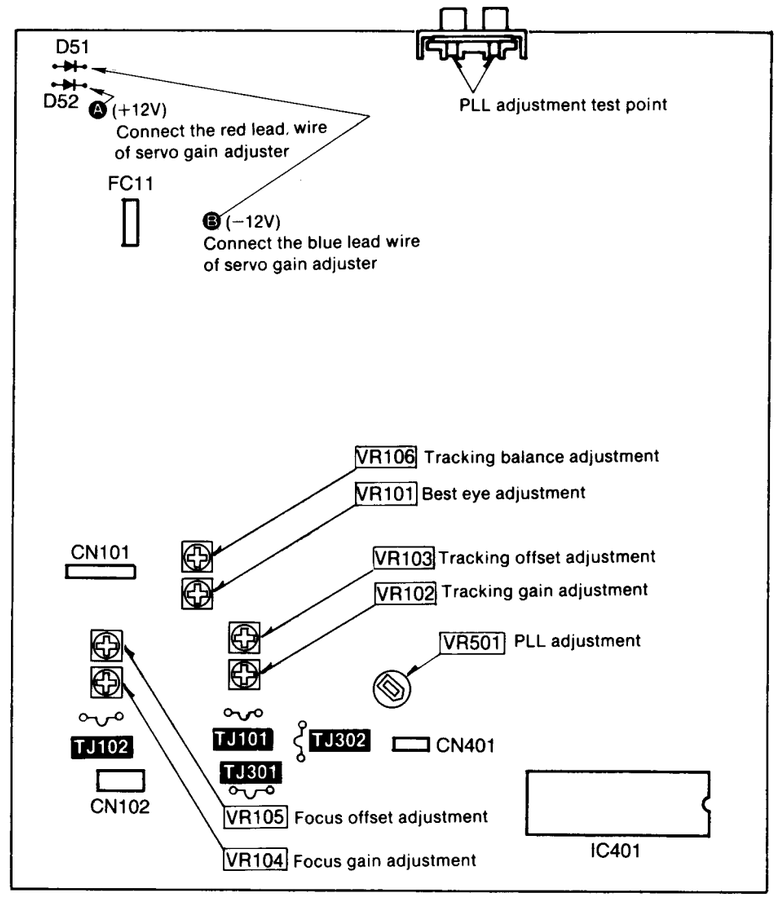
■ MEASUREMENTS AND ADJUSTMENTS

Caution:

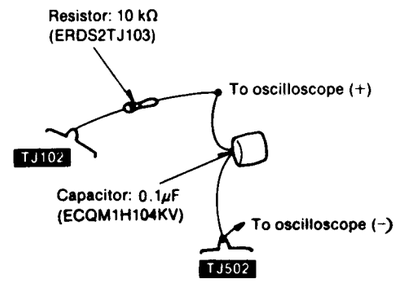
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam , especially when performing adjustments.

ADJUSTMENT POINTS

- **Main P.C.B.**



- **Filter for turntable height adjustment**



ELECTRICAL ADJUSTMENT

Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector(SZZP1032F)

Adjustment Procedure

Step 1: Remove the cabinet. (Refer to page 8.)

Step 2: Make the temporary setting of each VR . (Refer to page 14.)

Step 3: Best eye (PD balance) adjustment. (Refer to page 14.)

Step 4: Connect the servo gain adjuster. (Refer to page 13.)

Step 5: Focus gain adjustment. (Refer to page 14.)

Step 6: Tracking gain adjustment. (Refer to page 14.)

Step 7: Focus offset adjustment (Refer to page 15.)

Step 8: Tracking offset adjustment. (Refer to page 15.)

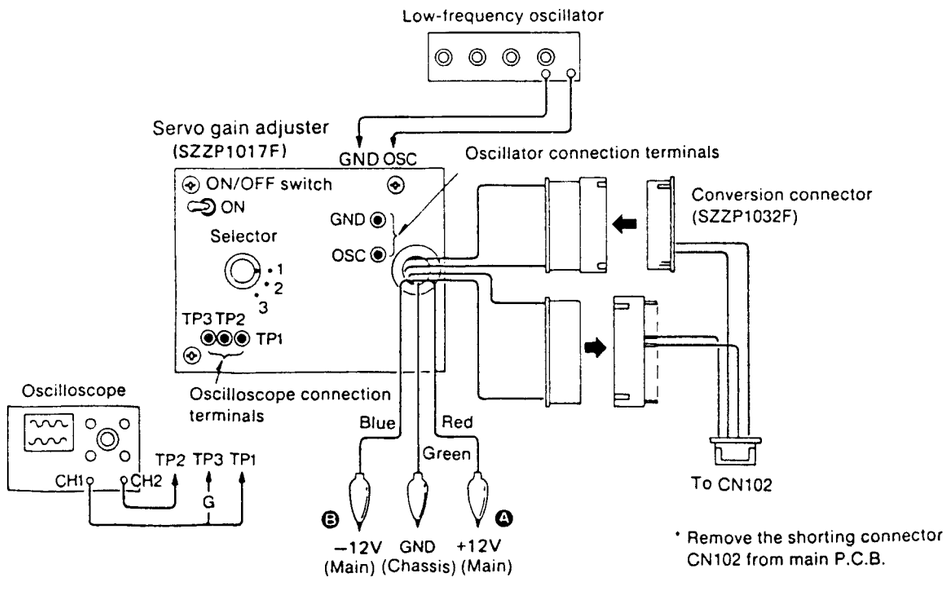
Step 9: Tracking offset balance adjustment.(Refer to page 15.)

Step 10: Disconnect the servo gain adjuster.

Step 11:PLL adjustment. (Refer to page 16.)

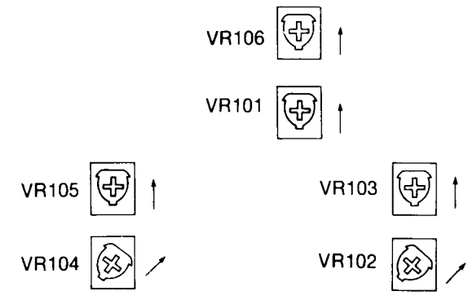
Step 12: Check of operation after adjustment. (Refer to page 16.)

Connection of Servo Gain Adjuster



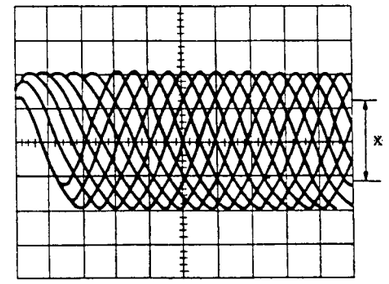
TEMPORARY SETTING OF EACH VR

Note :
If a disc skips or can not be played back , adjust each VR temporarily, as shown.



BEST EYE(PD BALANCE) ADJUSTMENT

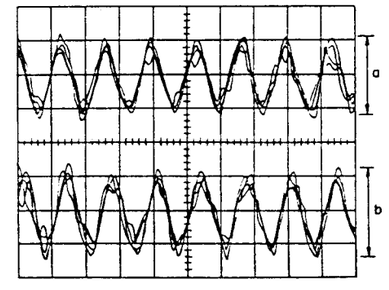
1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
3.Set the player to the play mode.
4.Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.
5.Turn **OFF** the power switch of the player.



*Most stretched eye pattern

FOCUS GAIN ADJUSTMENT

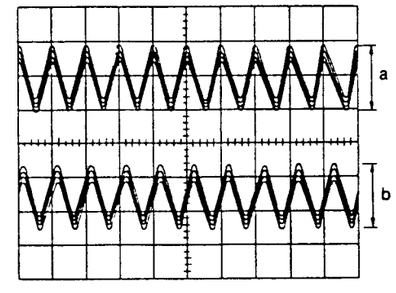
1.Connect the servo gain adjuster.(Refer to page 13.)
2.Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON.**
3.Set the low frequency oscillator to a frequency of **750Hz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4.Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(TP3 is the ground terminal.)
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....1msec.
INPUT.....DC
5.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
6.Set the player to the play mode.
7.Set the selector switch of the servo gain adjuster from **"2" to "3".**
8.**750Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9.Shift the selector switch of the servo gain adjuster from **"3" to "2".**



* Make a=b

TRACKING GAIN ADJUSTMENT

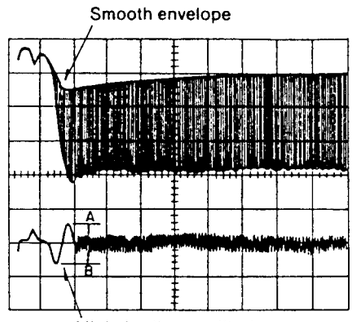
1.Oscilloscope setting and connection are same as above.
2.Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p.**
3.Set the selector switch of the servo gain adjuster from **"2" to "1".**
4.**1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
5.Shift the selector switch of the servo gain adjuster from **"1" to "2".**



*Make a=b

FOCUS OFFSET ADJUSTMENT

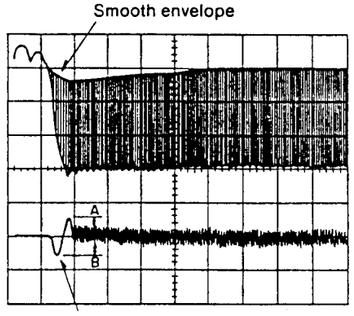
1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ102** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

TRACKING OFFSET ADJUSTMENT

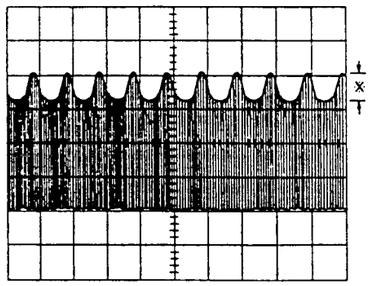
1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ101** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103**, so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

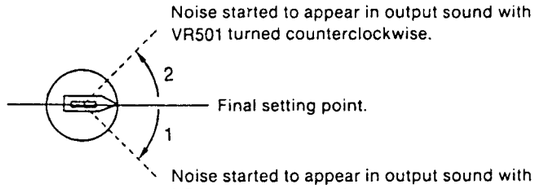
TRACKING OFFSET BALANCE ADJUSTMENT

1.Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
2.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5msec.
INPUT.....AC
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Set the selector switch of the servo gain adjuster from **"2"** to **"1"**.
6.Adjust **VR106**, so that the output waveform is as shown (jitter is minimized).
7.Shift the selector switch of the servo gain adjuster from **"1"** to **"2"**.
8.Turn **OFF** the power switch of the player.
9.Disconnect the servo gain adjuster, and insert the shorting connector of CN102 to the original position.

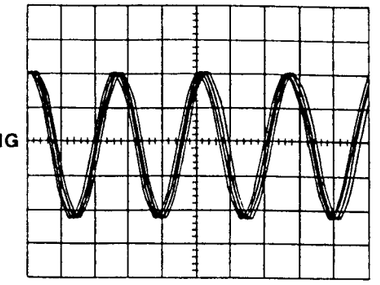

Jitter should be minimized.

PLL ADJUSMENT

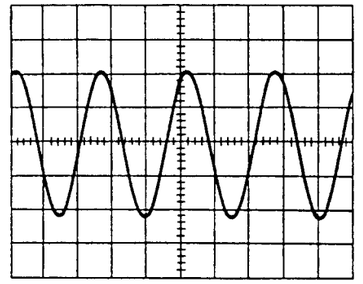
1.Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground.**
Oscilloscope setting:VOLT.....1V
SWEEP.....1msec.
INPUT.....DC
2.Turn **ON** the power switch of the player and insert the test disc(SZZP1054C).
3.Play **Track No.6 (wedge 0.7mm)** of the test disc.
4.Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.
Step 1. Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 2. Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 3. Set **VR501** in the middle between the points observed in the above steps " 1 " and " 2 " .


Noise started to appear in output sound with VR501 turned counterclockwise.
2
Final setting point.
1
Noise started to appear in output sound with VR501 turned clockwise.

• NG



• OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search
1.Play an ordinary disc.
2.Press the skip button and verify skip search operation (forward and reverse).

Check of manual search
1.Play an ordinary disc.
2.Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability
1.Play the test disc (SZZP1054C).
2.Play the track No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3.Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

Measuring Instruments and Special Tools

- Tow-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (SZZP1044C....1.5mm)
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter (Refer to page 12)

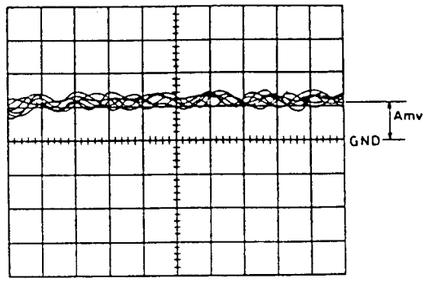
Adjustment Procedure

- If the optical pickup and spindle motor are replaced , adjust it according to the following procedure.

Step 1: Make the temporary of each VR.(Refer to page 14.)
↓
Step 2: Turntable height adjustment. (Refer to page 17.)
↓
Step 3: Mechanical adjustment. (Refer to page 17.)
↓
Step 4: Electrical adjustment. (Refer to page 13.)

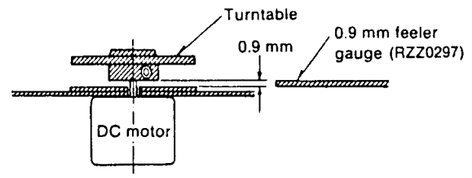
TURNTABLE HEIGHT ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ102** (+) and **TJ302** (-) of the main P.C.B.through the filter.(Refer to page 12.)
Oscilloscope setting:VOLT.....50mV
SWEEP.....1msec.
INPUT.....DC
2.Set the oscilloscope to DC zero balance.
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Measure the DC level (AmV) displayed on the oscilloscope.
If the value of A is within the range of ± 60mV , the turntable height is correct. If it is not within this range , make the necessary adjustments using the 0.9mm feeler gauge (RZZ0297). If A is more than +60mV , make the turntable lower. If A is less than -60mV , make the turntable higher.



Adjust the turntable height as follow:

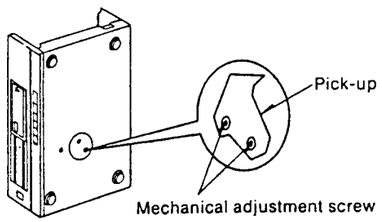
A.Insert the 0.9mm feeler gauge(RZZ0297) as shown below.



B.Loosen the turntable set-screw.
C.Adjust the turntable height to 0.9mm with the feeler gauge as shown above.
D.Tighten the turntable set-screw by using a 1.27mm hexagonal wrench.
E.Check the turntable height adjustment by following steps 1 ~ 5 above.

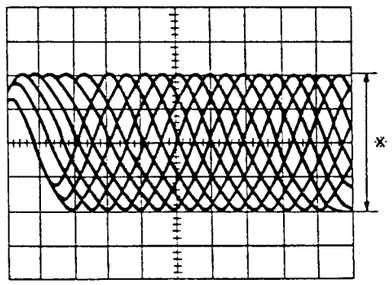
MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.



Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

4.Monitoring RF signal on the oscilloscope, adjust **the two adjusting screws** alternatelywith the 1.5mm hexagonal wrench (SZZP1044C) so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.



■ TERMINAL FUNCTION OF LSI

• MN6622 (Digital Signal Processing: EFM Decoder, Error Correction ,CLV Servo)

Pin No.	Mark	I/O	Function
1	MEMP	I	Emphasis signal input
2	PC	O	Spindle motor "ON" signal(ON at "L")
3	EC	O	Spindle motor drive signal
4	FG	I	Not connected
5	TTF	I	Spindle motor free run
6	FLAG0	O	Not connected
7	IPFLAG	O	Not connected
8	FLAG6	O	Not connected
9	PCK	I	PLL extract clock input(4.2336MHz)
10	VDD	I	Power supply (connected to +5V)
11	EFM	I	EFM signal input (PLL)
12	SRF	I	EFM signal input (DSL)
13	DO	I	Drop-out signal ("H" at drop-out)
14	CLVS	O	Not connected
15	EPC	O	PLL frequency comparison signal
16	BSSEL	O	Not connected
17	RIN	I	Remote control signal input
18	FSL	I	Not used (connected to GND)
19	SLEEP	I	Not used (connected to GND)
20	SUBC	O	Not connected
21	SBCK	I	Not connected
22	BLKCK	O	Sub-code block(Q-data) clock (75Hz)
23	CLDCK	O	Sub-code frame(Q-data) clock (7.35kHz)
24	SUBQ	O	Sub-code(Q-data) output
25	CRC	O	Not connected
26	RST	O	Reset signal input ("L" = Reset)
27	MLD	I	Data input (command load)
28	MCLK	I	Data clock input (command clock)
29	MDATA	I	Data input (command data)
30	DMUTE	I	Muting control (Not used, connected to GND)
31	TRON	I	Tracking servo "ON" signal (ON at "L")
32	STAT	O	Processing condition (CRC,OTC,CLVOK,TT,STOP) output
33	TX	O	Digital output signal

Pin No.	Mark	I/O	Function
34	TSTR	I	Not used (connected to +5V)
35	TEST	I	Not used (connected to +5V)
36	VSS	I	GND terminal
37	X2	O	Clock output (16.9344MHz)
38	X1	I	Clock input (16.9344MHz)
39	SEL	I	Not used (connected to GND)
40	LDG/ WDCKS	O	Deglitch signal at Lch/ word clock for serial DAC
41	RDG	O	Not connected
42	DEMPH	O	Not connected
43	SMCK	O	Clock output (4.2336MHz)
44	WS	O	Not connected
45	SRCK	O	Not connected
46	XCK	O	Clock output (16.9344MHz)
47	DA15/ SRDATA	O	DA parallel output(MSB)/ Serial data output(MSB FIRST)
48	DA14/ SRDATA	O	Not connected
49	DA13/ SCK	O	DA Parallel output/ serial data output bit clock
50	DA12/ WDCK	O	Not connected
51	DA11/ BYTCK	O	Not connected
52	VSS	I	GND terminal
53	DA10/R/L	O	DA parallel output/ R/L signal (R at "H")
54 – 56	DA9 – DA7	O	Not connected
57	DA6	O	Not used (connected to GND)
58 – 63	DA5 – DA0	O	Not connected
64 – 71	D7 – D0	I/O	16K RAM DATA
72	RAMOE	O	16K RAM OE signal
73	RAMWE	O	16K RAM WE signal
74 – 84	RAMA0 – RAMA10	O	16K RAM address

• MN53010PEH (Serial/Parallel converter)

Pin No.	Mark	I/O	Function
1	WCO	O	Output data word clock (DALO,DBLO,DARO,DBRO)
2	DARO	O	Rch data output, (+)terminal
3	DBRO	O	Rch data output, (-)terminal
4	RST	O	Reset output data to "0"
5	VDD	I	Power supply (connected to +5V)
6	VSS	I	GND terminal
7	F2DAC	I	"H": 2DAC 18-bit "L": 2DAC 17-bit
8	FLOAT	I	"H": 4DAC 18-bit "L": 4DAC 17-bit
9	PHASE	I	"H": Phase inversion "L": Normal mode
10	LRCK	I	Inverter input
11	LRCK	O	LRCK signal inverter output
12	SIN	I	Data input
13	WCI	I	Input data word clock
14	BCI	I	Input data bit clock
15	VSS	I	GND terminal
16	NC	---	Not connected
17	VDD	I	Power supply (connected to +5V)
18	SHR	I	Rch Deglitcher signal

Pin No.	Mark	I/O	Function			
18	SHR	I	Rch Deglitcher signal			
19	SHL	I	Lch Deglitcher signal			
20 31	NC	---	Not connected			
			NORMAL MODE delay: 180ms	TEST MODE delay: 1.45ms	TEST MODE delay: 0.73ms	TEST MODE delay: 0ms
32	NTEST1	I	H	L	H	L
33	NTEST2	I	H	H	L	L
34	NTEST3	I	"H": Normal mode "L": Reset			
35	DALO	O	Lch data output, (+)terminal			
36	DBLO	O	Rch data output, (-)terminal			
37	VDD	I	Power supply (connected to +5V)			
38	VSS	I	GND terminal			
39	NC	---	Not connected			
40	GAIN	O	Gain selector signal H: 0~-12dB L: below -12dB			
41	SH	O	Deglitch signal H: Sample L: Hold			
42	BCO	O	Output data bit clock			

• AN8371S (Data slice and PLL)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D.GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free run frequency adjusting current input (not connected)
8	VC1	I	Capacitor connection for VCO oscillator frequency
9	VC2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection

Pin No.	Mark	I/O	Function
13	PL2	I	PLL loop filter connection
14	FPC	I	Frequency comparison error signal input
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC output
17	AGC	I	ARF signal input for AGF drop-out detection input
18	AC	I	Loop filter for AGC connected
19	DO	O	Drop-out detection pulse output
20	A.GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicing
22	SLC	I	Slicing level control signal input
23	FC1	I	Filter capacitor for data slicer connected
24	FC2	I	Filter capacitor for data slicer connected

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE(+)	I	Phase difference to voltage conversion (+)
9	TE(-)	I	Phase difference to voltage conversion (-)
10	APC(-)	I	Laser power inversion input
11	C.MEM	I	Capacitor connection for phase difference memory
12	APC(+)	I	Laser power non inversion input
13	VREFE	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Trackcrossing speed control output (not used, (Not connected)
18	C.MSP	I	Trackcrossing reference speed setting capacitor connection (Not connected)
19	C.AF	I	Auto focus timer capacitor connection
20	KICK	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input (FOON Focus servo "ON" signal)

Pin No.	Mark	I/O	Function
23	CNT2	I	Control input (TRON Tracking servo ON signal)
24	CNT3	I	Control input (KICKF Kick direction [Foward] command)
25	CNT4	I	Control input (KICKR Kick direction [Reverse] command)
26	F.LOCK	O	Focus lock signal output
27	C.FBDO	O	Capacitor connection for inversion RF high detection
28	C.SBDO	O	Capacitor connection for inversion RF low detection
29	C.SBRT	O	Capacitor connection for non-inversion RF slow detection
30	C.FBRT	O	Capacitor connection for non-inversion RF fast detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RF IN	I	RF signal input
34	S.OUT	O	Focus search signal output
35	C.LW	I	Capacitor connection for triangular wave generation
36	FE.OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE.REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detection current input (B)
40	IVB	O	Current/ voltage conversion (B)
41	IVA	O	Current/ voltage conversion (A)
42	PDA	I	Photo detection current input (A)

• YM3404B (Digital filter)

Pin No.	Mark	I/O	Function
1	SHL	O	1DAC(ST="L"): Lch Deglitcher signal 2DAC(ST="H"): L/Rch Deglitcher signal
2	X0	O	Clock output
3	X1	I	Clock input
4	VDD2	I	Power supply (connected to +5V)
5	BCI	I	Bit clock input (input data)
6	SDSY	I	R/L signal
7	SDI	I	Data input
8	VDD1	I	Power supply (connected to +5V)

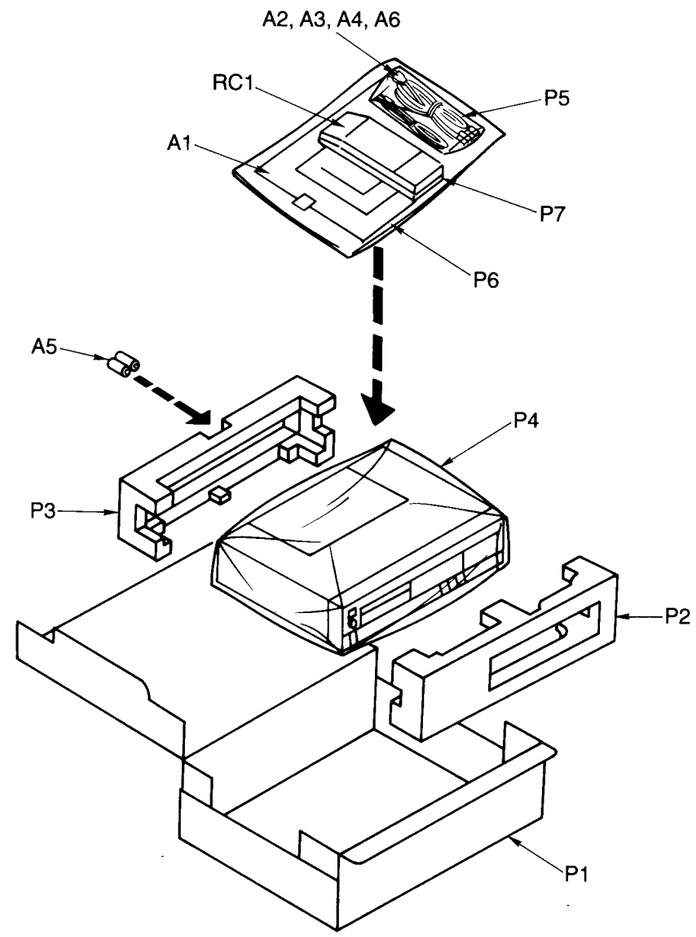
Pin No.	Mark	I/O	Function
9	DLO	O	1DAC(ST="L"): L/Rch data output terminal 2DAC(ST="H"): Lch data output terminal
10	RDO	O	Rch data output (not connected)
11	WCO	O	Output data word clock
12	BCO	O	Bit clock output (output data)
13	VSS	I	GND terminal
14	ST	I	1DAC/2DAC selector terminal
15	FEN	I	System clock selector terminal
16	SHR	O	1DAC(SP="L"): Rch deglitch signal

• MN1554PEF (System Control)

Pin No.	Mark	I/O	Function
1	GND	I	GND terminal
2	DMUTE	O	Muting control
3	MDATA	O	Command data output
4	MCLK	O	Data clock output (command clock)
5	MLD	O	Data output (command load)
6	DOUTON	O	Optical output control signal
7	EMPH	O	Emphasis signal output
8	P11	I	Not connected
9	P12	I	Not connected
10	P13	I	Not connected
11	SYNC	O	Not connected
12	SIRQ	I	Not used (connected to +5V)
13	BLKCK	I	Sub-code block(Q data) clock input (75Hz)
14	CLDCK	I	Sub-code block(Q data) clock input (7.35KHz)
15	SBO	I	Not connected
16	SUBQ	I	Sub-code(Q data) input
17	RST	I	Reset signal input
18	P20	O	Not used (connected to +5V)
19	P21	O	Not used (connected to +5V)
20	P22	O	Not used (connected to +5V)
21	P23	O	Not used (connected to +5V)
22	CLOSE	O	Loading motor "Close" command
23	OPEN	O	Loading motor "Open" command
24	P32	O	Not connected
25	MUTE2	O	Muting control
26	SEEK	O	Traverse serro control
27	P41	O	Not connected
28	TRV.R	O	Traverse "Reverse" command signal
29	TRV.F	O	Traverse "Forward" command signal
30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
32	CNT2	O	Optical servo IC control (TRON: Tracking servo)

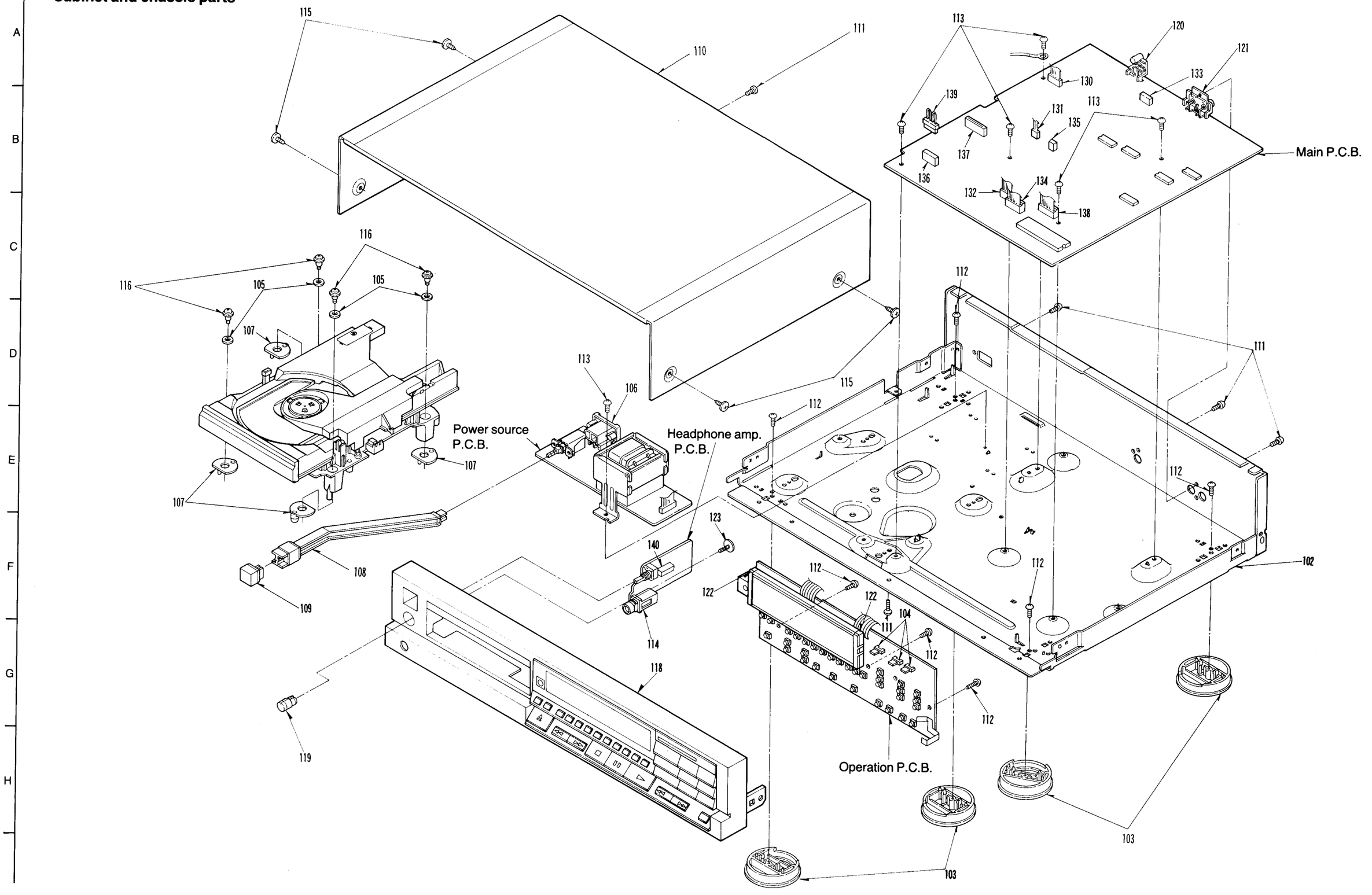
Pin No.	Mark	I/O	Function
33	VDD	I	Power supply (connected to +5V)
34	VR.R	O	Not connected
35	VR.F	O	Not connected
36	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
37	P60	I	Disc holder "Open/close" detection
38	P61	I	Disc holder "Open/close" detection
39	P62	I	Not used (connected to GND)
40	P63	I	Not used (connected to GND)
41	STAT	I	Processing status input from signal processing LSI
42	COMP	O	TOC reading control (ON at "L")
43	FLOCK	I	Optical servo condition(focus) input
44	SENSE	I	Optical servo condition(track cross) input
45	RECK	I	Data receipt command signal
46	SEND	I	Data transmission command
47	ACK	I	Data discrimination signal
48	CLK	I	Data lock signal
49	D0	I	Key scan
50	D1	I	Key scan
51	D2	I	Key scan
52	D3	I	Key scan
53	PA0	I	
54	PA1	I	Not connected
55	PA2	I	
56	PA3	I	Not connected
57	PB0	I	Not connected
58	PB1	I	Key scan
59	PB2	I	Key scan
60	PB3	I	Key scan
61	OSC2	I	Clock terminal
62	OSC1	I	Clock input
63	X1	I	Optical servo condition input
64	X0	O	Not connected

■ PACKING

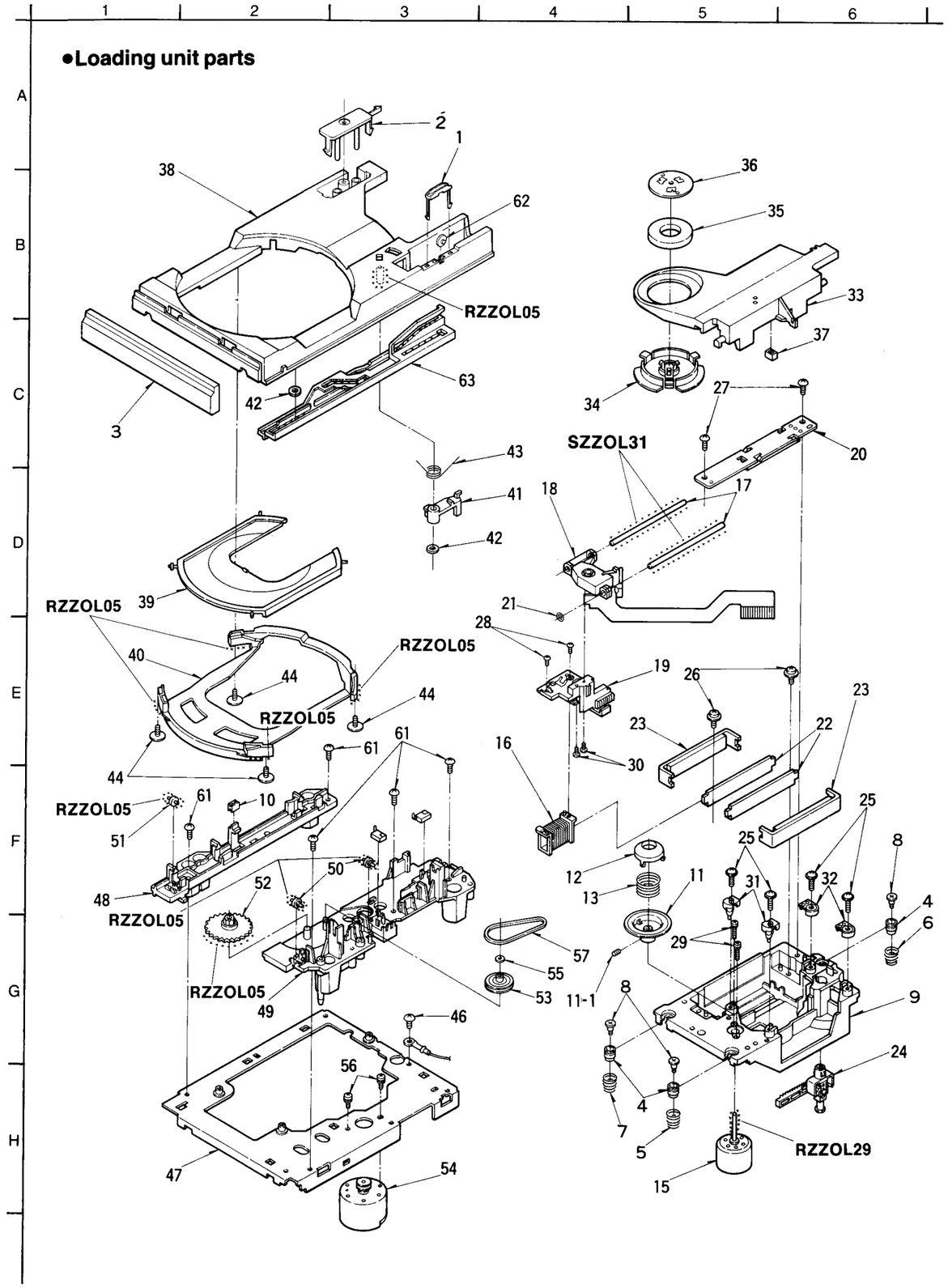


■ EXPLODED VIEWS

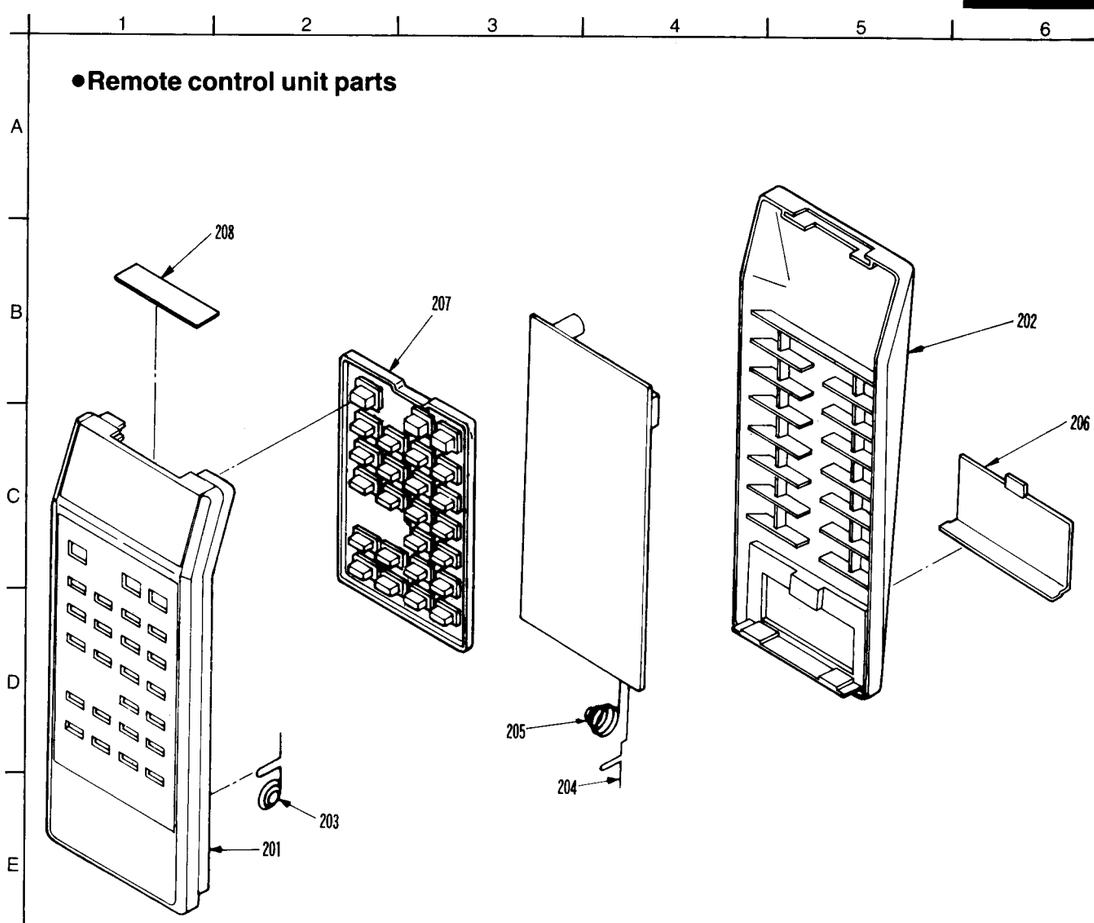
•Cabinet and chassis parts



●Loading unit parts



●Remote control unit parts



■ REPLACEMENT PARTS LIST

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.
* Remote Control Ass'y:
Supply period for three years from termination of production.
* Ⓜ Indicates parts that the supplied by **MESA.**

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C. REGULATOR
IC12	SVIBA4558F	I.C. MOTOR CONTROL
IC101	AN8370S	I.C. OPTICAL SERVO
IC102	MN6636S	I.C. ANALOG SW.
IC103	AN6554NS	I.C. TRAVERSE SERVO
IC104	SVIBA4558F	I.C. FO/TR COIL DRIVE
IC105	SVIBA4558F	I.C. FO/TR COIL DRIVE
IC301	MN6622	I.C. MICROCOMPUTER
IC302	YM3404B	I.C. DIGITAL FILTER
IC303	SVICXK5816M	I.C. 16K RAM
IC305	MN74HC04S	I.C. INVERTER
IC401	MN1554PEF	I.C. SYSTEM CONTROL
IC402	BA6218	I.C. MOTOR DRIVE
IC501	AN8371S	I.C. DATA SLICE AND PLL
IC601	MN15283PEJ	I.C. SYSTEM CONTROL
IC602 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	HC-MD10E	I.C. REMOTE SENSOR
IC602 (M, MC)	HC-MD12M	I.C. REMOTE SENSOR
IC801	PCM56P	I.C. D/A CONVERTER
IC802	PCM56P	I.C. D/A CONVERTER
IC804	SVIM5238FPTA	I.C. BUFFER AMP.
IC871	SVINJM4556SA	I.C. HEADPHONES AMP.
TRANSISTORS		
Q11	2SD1862-P	TRANSISTOR
Q12	2SB1240-P	TRANSISTOR
Q13	2SD1762DEF	TRANSISTOR
Q17	2SB1238QS	TRANSISTOR
Q18	2SC3311A-Q	TRANSISTOR
Q19	2SA1309QRS	TRANSISTOR
Q20	2SD1862-P	TRANSISTOR
Q21	2SB1240-P	TRANSISTOR
Q101	2SC4010-P	TRANSISTOR
Q141	2SD1862-P	TRANSISTOR
Q142	2SB1240-P	TRANSISTOR
Q161	2SD1862-P	TRANSISTOR
Q162	2SB1240-P	TRANSISTOR
Q181	2SC1846-Q	TRANSISTOR
Q182	2SA885Q	TRANSISTOR
Q351	UN4112	TRANSISTOR
Q352	2SD1862-P	TRANSISTOR
Q353	2SB1240-P	TRANSISTOR
Q401	2SC3311A-Q	TRANSISTOR
Q402	2SC3311A-Q	TRANSISTOR
Q501	UN4112	TRANSISTOR
Q601	UN4114	TRANSISTOR
Q602	UN4114	TRANSISTOR
Q801	2SD1330R	TRANSISTOR
Q802	2SD1330R	TRANSISTOR
Q803	2SD1330R	TRANSISTOR
Q804	2SD1330R	TRANSISTOR
Q805	UN4112	TRANSISTOR
Q806	UN4111	TRANSISTOR
Q808	2SA1309QRS	TRANSISTOR
Q810	UN4212	TRANSISTOR
Q811	2SD1330R	TRANSISTOR
Q812	2SD1330R	TRANSISTOR
Q813	2SD1330R	TRANSISTOR
Q814	2SD1330R	TRANSISTOR
Q815	UN4112	TRANSISTOR
Q816	UN4112	TRANSISTOR
Q871	2SD1330R	TRANSISTOR
Q872	2SD1330R	TRANSISTOR

Ref. No.	Part No.	Description
DIODES		
D11 ⚠	SVD1SR35200A	RECTIFIER
D12 ⚠	SVD1SR35200A	RECTIFIER
D13 ⚠	SVD1SR35200A	RECTIFIER
D14 ⚠	SVD1SR35200A	RECTIFIER
D17 ⚠	SVD1SR35200A	RECTIFIER
D18 ⚠	SVD1SR35200A	RECTIFIER
D19 ⚠	SVD1SR35200A	RECTIFIER
D20	MA4068H	DIODE
D21	MA4068H	DIODE
D22	MA4056-M	DIODE
D23	MA4082M	DIODE
D24	SVDMTZ33	DIODE
D25	MA4033M	DIODE
D26	MA4033M	DIODE
D51 ⚠	SVD1SR35200A	RECTIFIER
D52 ⚠	SVD1SR35200A	RECTIFIER
D131	MA165	DIODE
D181	MA165	DIODE
D182	MA165	DIODE
D183	MA165	DIODE
D184	MA165	DIODE
D401	MA4033M	DIODE
D601	SVGDPG7851Y	L.E.D
D602	SVGDPG7851Y	L.E.D
D603	SVGDAY7851	L.E.D
D604	MA165	DIODE
D605	MA165	DIODE
D606	MA165	DIODE
D607	MA165	DIODE
D608	MA165	DIODE
D609	MA165	DIODE
D610	MA165	DIODE
D611	MA165	DIODE
D612	MA165	DIODE
D801	MA165	DIODE
D803	MA165	DIODE
D804	MA165	DIODE
D805	MA165	DIODE
D806	MA165	DIODE
D807	MA165	DIODE
D808	MA165	DIODE
D809	MA165	DIODE
D810	MA165	DIODE
D811	MA165	DIODE
D812	MA165	DIODE
I.C.PROTECTORS		
ICP1 ⚠ (EK, XA, XB) (PA, PE, PC)	SRUF38	I.C.PROTECTOR
ICP2 ⚠ (EK, XA, XB) (PA, PE, PC)	SRUF38	I.C.PROTECTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B53	V.R. BEST EYE ADJ.
VR102	EVND3AA00B14	V.R. TR GAIN ADJ.
VR103	EVND3AA00B14	V.R. TR OFFSET ADJ.
VR104	EVND3AA00B14	V.R. FO GAIN ADJ.
VR105	EVND3AA00B14	V.R. FO OFFSET ADJ.
VR106	EVND3AA00B53	V.R. TR BALANCE ADJ.
VR501	EVN38CA00B13	V.R. PLL ADJ.
VR871	EVUN1A022A14	V.R. HEADPHONES LEVEL
COILS AND TRANSFORMERS		
L301	ELEY4R7KA	COIL
L302	ELEV2R7KA	COIL
L303	ELEV2R7KA	COIL

Ref. No.	Part No.	Description
L304	ELEY1R0KA	COIL
L305	ELEV2R7KA	COIL
L801	ELEV821KA	COIL
L802	ELEV821KA	COIL
L871	ELEPK1R0KA	COIL
L872	ELEPK1R0KA	COIL
L873	ELEPK1R0KA	COIL
T1 ⚠ (M, MC)	SLTD5K065SC	POWER TRANSFORMER
T1 ⚠ (E, EG, EB, EH) (EF, EI)	SLTD5K066SE	POWER TRANSFORMER
T1 ⚠ (EK, XL)	SLTD5K067SG	POWER TRANSFORMER
T1 ⚠ (XA, XB, PA) (PE, PC)	SLTD5K068SX	POWER TRANSFORMER
T301	SLZS10VN17	PULSE TRANSFORMER
OSCILLATORS		
X301	SVQAT1693ATA	OSC., 16.9344MHZ
DISPLAYS		
FL601	SAD16BT08GK	DISPLAY
FUSES		
F1 ⚠ (E, EK, XL, EG) (EB, EH, EF) (EI)	XBA2C012TB0	FUSE, 250V, T125mA
F1 ⚠ (XA, XB, PA) (PE, PC)	XBA2C025TB0	FUSE, 250V, T250mA
SWITCHES		
S1 ⚠	ESB8249V	SW POWER

Ref. No.	Part No.	Description
S2 ⚠ (XA, XB, PA) (PE, PC)	SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD15	SW, REST
S102	SSPD16	SW, REST
S601	EVQQS405K	SW, OPEN/CLOSE
S602	EVQQS405K	SW, STOP
S603	EVQQS405K	SW, PAUSE
S604	EVQQS405K	SW, PLAY
S605	EVQQS405K	SW, PROGRAM
S606	EVQQS405K	SW, RECALL
S607	EVQQS405K	SW, TIME
S609	EVQQS405K	SW, NUMERIC(1)
S610	EVQQS405K	SW, NUMERIC(2)
S611	EVQQS405K	SW, NUMERIC(3)
S612	EVQQS405K	SW, NUMERIC(4)
S613	EVQQS405K	SW, NUMERIC(5)
S614	EVQQS405K	SW, CLEAR
S615	EVQQS405K	SW, F.SIKP
S616	EVQQS405K	SW, F.SEARCH
S617	EVQQS405K	SW, NUMERIC(6)
S618	EVQQS405K	SW, NUMERIC(7)
S619	EVQQS405K	SW, NUMERIC(8)
S620	EVQQS405K	SW, NUMERIC(9)
S621	EVQQS405K	SW, NUMERIC(10)
S622	EVQQS405K	SW, NUMERIC(0)
S623	EVQQS405K	SW, R.SKIP
S624	EVQQS405K	SW, R.SEARCH
S625	EVQQS405K	SW, SIDE A/B
S626	EVQQS405K	SW, EDIT
S627	EVQQS405K	SW, PEAK
S628	EVQQS405K	SW, DISPLAY
S629	EVQQS405K	SW, NUMERIC(+10)
S631	EVQQS405K	SW, A/B REPEAT
S634	EVQQS405K	SW, REPEAT

●Loading unit parts (Refer to 25 page)

Ref. No.	Part No.	Description
LOADING MECHANICAL		
1	SHRD150	ROLLER HOLDER
2	SHRD144	COVER WITH CLAW
3 Ⓚ	SGXD3240ZK0B	ORNAMENT PANEL
3 Ⓢ	SGXD3240MA0A	ORNAMENT PANEL
4	SHGD110	CUSHION RUBBER
5	SUSD126	SPRING (RED)
6	SUSD127	SPRING (BLUE)
7	SUSD128	SPRING (YELLOW)
8	SFXGB20-01	SCREW
9	SISD13-3	TRAVERSE BASE
10	SFGZB63M51	CUSHION RUBBER
11	SD0D28-1E	TURNTABLE
11-1	XXE26D5	SCREW
12	SD0D29-2	RING
13	SRQA010N04	SPRING
15	SJGDRF310T	SPINDLE MOTOR
16	S0RD21E-1	TRAVERSE COIL
17	SUXD78-2	GUIDE SHAFT
18 ⚠	S0AD60A-1	OPTICAL PICKUP
19	EWSL11A00000	COIL HOLDER
20	EWS7G0A00Q53	RESISTANCE UNIT
21	SHGD131	STOPPER
22	S0YD8E-1	YOKE (A)
23	S0YD9	YOKE (B)
24	SHRD23-2	LOCK SHAFT
25	XTV3+12GFZ	SCREW
26	SNSD27	SCREW
27	XTV3+8G	SCREW
28	XTV2+4G	SCREW
29	XYM2+C12	SCREW
30	XQN17+C6	SCREW
31	SHRD136	GUIDE SHAFT HOLDER(A)
32	SHRD137	GUIDE SHAFT HOLDER(B)
33	SIRD42-2	CLAMPER
34	SIRD51	HOLDER
35	S0MD4	MAGNET
36	S0YD2	YOKE
37	SHGD119	CUSHION RUBBER
38	SIRLP990-KM	DISC HOLDER
39	SIRD98	DISC TRAY
40	SIRD99	TRAY BASE
41	SIRD96	LOCK LEVER
42	SFUMZ15R61	WASHER
43	SUSD83	SPRING
44	SFXGQ06N01	SCREW
46	XTV3+6BFN	SCREW
47	SIWLP320-KM	LOADING BASE
48	SIRD43-3	BRACKET(A), LOADING BASE
49	SIRLP320KM3	BRACKET(B), LOADING BASE
50	SDRD2	ROLLER
51	SDRD6	ROLLER
52	SDGD38	MAIN GEAR
53	SDGD39-2	PULLEY GEAR
54	SMNLP320-KM	LOADING MOTOR
55	SHWD20	WASHER
56	XYN26+T4	SCREW
57	SMBD3	DRIVE BELT
61	XTV3+8JFZ	SCREW
62	SDRD12	ROLLER
63	SIRD40-2	RACK GEAR

●Cabinet and chassis parts (Refer to 23～24 pages)

Ref. No.	Part No.	Description
CABINET AND CHASSIS		
102 (M, MC)	SGPD760ZF0E	CHASSIS
102 (XA)	SGPD760ZF1F	CHASSIS
102 (E)	SGPLP350-KE	CHASSIS
102 (EB, EH, EF) (EI)	SGPLP350-KEB	CHASSIS
102 (EG)	SGPLP350-KEG	CHASSIS
102 (EK)	SGPLP350-KEK	CHASSIS
102 (PA, PE, PC)	SGPLP350-KPA	CHASSIS
102 (XB)	SGPLP350-KXB	CHASSIS
102 (XL)	SGPLP350-KXL	CHASSIS
103	SKLD8-E	FOOT
104	SHRD165	LED HOLDER
105	SHGD123	RUBBER SPACER
106 ⚠ (M, MC, XL)	SJSD16	AC INLET
106 ⚠ (E, EK, EG, EB) (EH, EF, EI) (XA, XB, PA) (PE, PC)	SJS9236	AC INLET
107	SHGD122-1	CUSHION RUBBER
108	SUBD15	ROD
109 Ⓚ	SBC666-5	BUTTON, POWER
109 Ⓢ	SBC666	BUTTON, POWER
110 Ⓚ	SKCD511KE1A	CABINET
110 Ⓢ	SKCD511SW1A	CABINET
111	XTB3+8JFZ	SCREW
112	XTB3+8G	SCREW
113	XTB3+8J	SCREW
114	SJJ126B	JACK(HEADPHONES)
115 Ⓚ	SNE2129-1	SCREW
115 Ⓢ	SNE2129	SCREW
116	SHDD4	SCREW
118 Ⓚ	SGYLP350-KM	FRONT PANEL
118 Ⓢ	SGYLP350-SE	FRONT PANEL
119 Ⓚ	SBN1161-2	KNOB, HEADPHONES LEVEL
119 Ⓢ	SBN1161-3	KNOB, HEADPHONES LEVEL
120	SJFD7	JACK (DIGITAL OUT)
121	SJFD4	OUTPUT TERMINAL(PHONO)
122	SHRD167	HOLDER
123	SFXGQ06N01	SCREW
CONNECTORS		
130	SJSD0605	CONNECTOR(FC11)
131	EMCS0350Z	CONNECTOR(CN103)
132	EMCS0550Z	CONNECTOR(CN401)
133	EMCS0750Z	CONNECTOR(CN801)
134	SJSD0905	CONNECTOR(FC402)
135	EMCS0250Z	CONNECTOR(CN351)
136	EMCS0552M	CONNECTOR(CN102)
137	SJSD1709	CONNECTOR(CN101)
138	SJSD0905	CONNECTOR(FC401)
139	SRDJ001N14E	SHORTING CONNECTOR(CN102)
140	EMCS0750Z	CONNECTOR(CN871)

●Remote control unit parts (Refer to 26 page)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	MN6030B	I.C. REMOTE SIGNAL
IC1 (M, MC)	MN6030CA	I.C. REMOTE SIGNAL
TRANSISTORS		
Q1	UN1231	TRANSISTOR
DIODES		
D1	LN66-S	L.E.D
D2	MA154WK	DIODE
D4	MA154WK	DIODE
D6	MA154WA	DIODE
OSCILLATOR		
X1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	CSB420PB1	OSCILLATOR
X1 (M, MC)	CSB455EB1	OSCILLATOR
RESISTORS		
R1	ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS		
C1 (M, MC)	ECKD1H101KB	CERAMIC, 100PF, 50V
C1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	ECKD1H471KB	CERAMIC, 470PF, 50V
C2 (M, MC)	ECKD1H101KB	CERAMIC, 100PF, 50V
C2 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	ECKD1H121KB	CERAMIC, 120PF, 50V
C3	ECEA0GK101	ELECTROLYTIC, 100μF, 4V
MECHANISM PARTS		
201 Ⓚ (M, MC)	UR64VCS532	UPPER CABINET
201 Ⓚ (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	UR64VCS534	UPPER CABINET
201 Ⓢ	UR64VCS575	UPPER CABINET
202 Ⓚ	UR64CS803A	LOWER CABINET
202 Ⓢ	UR64CS803B	LOWER CABINET
203	UR64TD374	BATTERY TERMINAL(COMMON)
204	UR64TD812	BATTERY TERMINAL(+)
205	UR64TD813	BATTERY TERMINAL(-)
206 Ⓚ	UR64EC804	BATTERY COVER
206 Ⓢ	UR64EC804A	BATTERY COVER
207	UR64CT811A	BUTTON
208	UR52SB327	PLATE
REMOTE CONTROL ASS'Y		
RC1 Ⓚ (M, MC)	EUR64781	REMOTE CONT.(REF TO NOTE)
RC1 Ⓚ (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	EUR64782	REMOTE CONT.(REF TO NOTE)
RC1 Ⓢ	EUR64783	REMOTE CONT.(REF TO NOTE)

●Packing parts (Refer to 22 page)

Ref. No.	Part No.	Description
PACKING MATERIAL		
P1 Ⓚ (M, E, EK, XL) (EG, EB, EH) (EI, XA, XB) (PA, PE, PC)	SPND266	CARTON BOX
P1 Ⓚ (MC)	SPND267	CARTON BOX
P1 Ⓚ (EF)	SPND268	CARTON BOX
P1 Ⓢ (E, EK, EG, EB) (EH, EI)	SPND271	CARTON BOX
P1 Ⓢ (EF)	SPND272	CARTON BOX
P2	SPSD144	PAD (FRONT)
P3	SPSD145	PAD (REAR)
P4	XZB60X60A010	PROTECTION BAG (UNIT)
P5	XZB26X17C03	PROTECTION BAG (CORDS)
P6	XZB23X35C03	PROTECTION BAG (INST. MANUAL)
P7	XZB10X26B05S	PROTECTION BAG(REMOTE CONT.)
ACCESSORIES		
A1 (M)	SQUD301	INSTRUCTION MANUAL
A1 (XL, XA)	SQUD303	INSTRUCTION MANUAL
A1 (EG)	SQUD305	INSTRUCTION MANUAL
A1 (EI)	SQUD307	INSTRUCTION MANUAL
A1 (EK)	SQUD308	INSTRUCTION MANUAL
A1 (E, EB, EH, EF)	SQULP350-KE	INSTRUCTION MANUAL
A1 (MC)	SQULP350-KMC	INSTRUCTION MANUAL
A1 (PA, PE, PC)	SQULP350-KPA	INSTRUCTION MANUAL
A1 (XB)	SQULP350-KXB	INSTRUCTION MANUAL
A2 ⚠ (EK)	SFDAC05G02	POWER CORD
A2 ⚠ (XA, PA, PE) (PC)	SJA168	POWER CORD
A2 ⚠ (MC)	SJA172	POWER CORD
A2 ⚠ (XL)	SJA173	POWER CORD
A2 ⚠ (M)	SJA175-1	POWER CORD Ⓜ
A2 ⚠ (XB)	SJA183	POWER CORD
A2 ⚠ (E, EG, EB, EH) (EF, EI)	SJA187	POWER CORD
A3 ⚠ (XA, XB, PA) (PE, PC)	RJP120ZBS-H	AC PLUG ADAPTOR
A4	SJP2249-1	OUTPUT CORD
A5 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	UM-4NE	BATTERY
A5 (M, MC)	UM-4NEP	BATTERY
A6	SJPD19	DIGITAL OUTPUT CORD

■ RESISTOR & CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

● Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

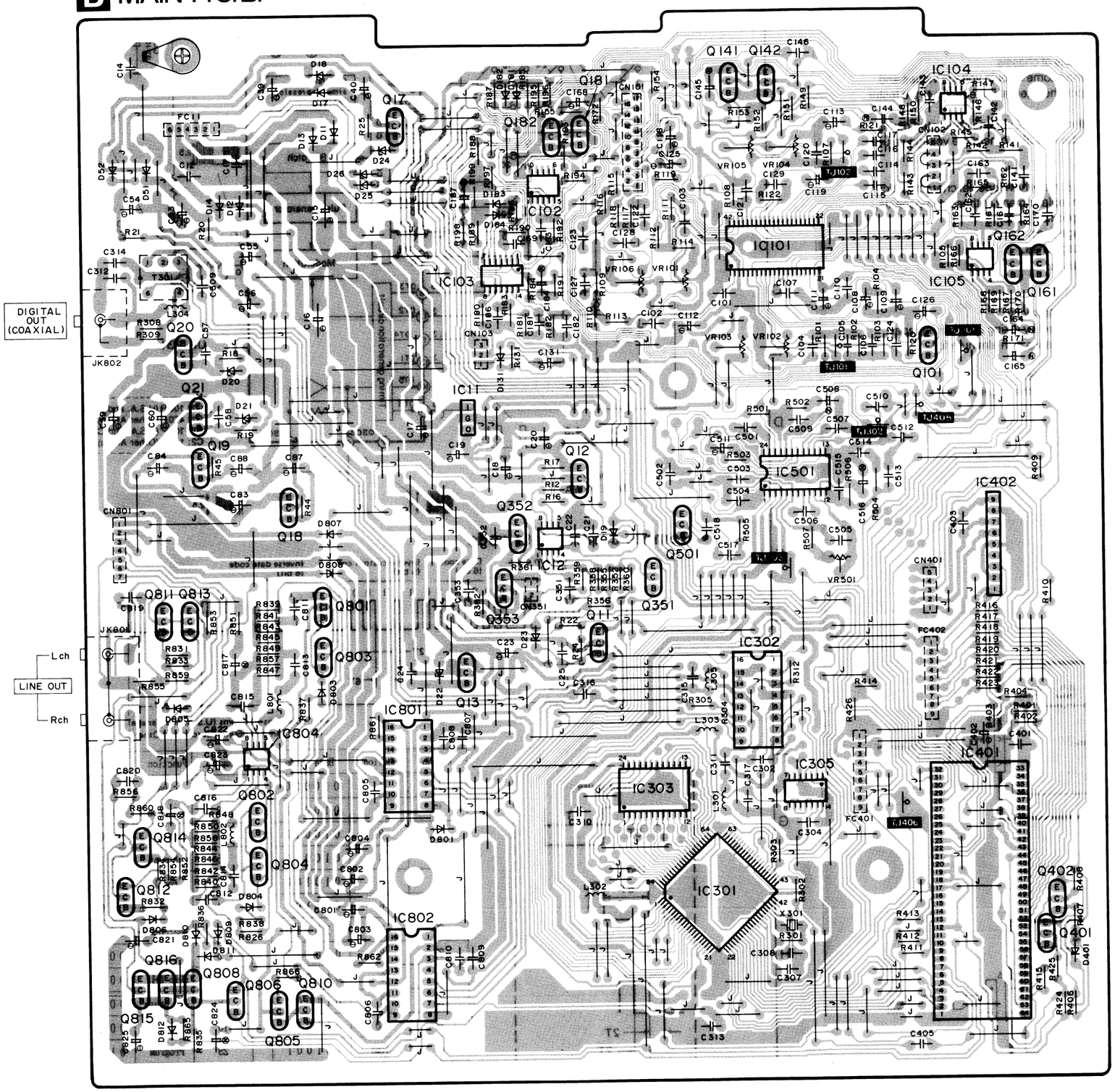
Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 −20 %
ECQM	: Poyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)								
R12	ERDS2TJ101	100 1/4	R147	ERDS2TJ682	6.8K 1/4	R302	ERDS2TJ152	1.5K 1/4
R16	ER0S2TKG6801	6.8K 1/4	R148	ERDS2TJ104	100K 1/4	R303	ERDS2TJ391	390 1/4
R17	ER0S2TKG6801	6.8K 1/4	R149	ERDS2TJ152	1.5K 1/4	R304	ERDS2TJ101	100 1/4
R18	ERDS2TJ331	330 1/4	R150	ERDS2TJ103	10K 1/4	R305	ERDS2TJ101	100 1/4
R19	ERDS2TJ331	330 1/4	R151	ERDS2TJ101	100 1/4	R308	ERDS2TJ151	150 1/4
R20	ERDS2TJ471	470 1/4	R152	ERDS2TJ153	15K 1/4	R309	ERDS2TJ151	150 1/4
R21	ERDS2TJ471	470 1/4	R153	ERDS2TJ270	27 1/4	R312	ERDS2TJ104	100K 1/4
R22	ERDS2TJ471	470 1/4	R154	ERDS2TJ3R3	3.3 1/4	R352	ERDS2TJ334	330K 1/4
R24	ERDS2TJ471	470 1/4	R155	ERDS2TJ330	33 1/4	R355	ERDS2TJ333	33K 1/4
R25	ERDS2TJ222	2.2K 1/4	R161	ERDS2TJ333	33K 1/4	R356	ERDS2TJ333	33K 1/4
R44	ERDS2TJ102	1K 1/4	R162	ERDS2TJ222	2.2K 1/4	R358	ERDS2TJ103	10K 1/4
R45	ERDS2TJ102	1K 1/4	R163	ERDS2TJ333	33K 1/4	R359	ERDS2TJ274	270K 1/4
R101	ERDS2TJ154	150K 1/4	R164	ERDS2TJ153	15K 1/4	R360	ERDS2TJ123	12K 1/4
R102	ERDS2TJ472	4.7K 1/4	R165	ERDS2TJ122	1.2K 1/4	R361	ERDS2TJ101	100 1/4
R103	ERDS2TJ472	4.7K 1/4	R166	ERDS2TJ102	1K 1/4	R362	ERDS2TJ8R2	8.2 1/4
R104	ERDS2TJ223	22K 1/4	R167	ERDS2TJ681	680 1/4	R401	ERDS2TJ472	4.7K 1/4
R105	ERDS2TJ334	330K 1/4	R168	ERDS2TJ272	2.7K 1/4	R402	ERDS2TJ472	4.7K 1/4
R107	ERDS2TJ683	68K 1/4	R169	ERDS2TJ392	3.9K 1/4	R403	ERDS2TJ472	4.7K 1/4
R108	ERDS2TJ332	3.3K 1/4	R170	ERDS2TJ101	100 1/4	R404	ERDS2TJ472	4.7K 1/4
R109	ERDS2TJ822	8.2K 1/4	R171	ERDS2TJ270	27 1/4	R406	ERDS2TJ221	220 1/4
R110	ERDS2TJ682	6.8K 1/4	R172	ERDS2TJ3R3	3.3 1/4	R407	ERDS2TJ102	1K 1/4
R111	ERDS2TJ682	6.8K 1/4	R180	ERDS2TJ474	470K 1/4	R408	ERDS2TJ102	1K 1/4
R112	ERDS2TJ822	8.2K 1/4	R181	ERDS2TJ471	470 1/4	R409	ERDS2TJ472	4.7K 1/4
R113	ERDS2TJ152	1.5K 1/4	R182	ERDS2TJ564	560K 1/4	R410	ERDS2TJ472	4.7K 1/4
R114	ERDS2TJ152	1.5K 1/4	R183	ERDS2TJ564	560K 1/4	R411	ERDS2TJ472	4.7K 1/4
R115	ERDS2TJ102	1K 1/4	R184	ERDS2TJ223	22K 1/4	R412	ERDS2TJ472	4.7K 1/4
R116	ERDS2TJ182	1.8K 1/4	R185	ERDS2TJ473	47K 1/4	R413	ERDS2TJ472	4.7K 1/4
R117	ERDS2TJ182	1.8K 1/4	R186	ERDS2TJ473	47K 1/4	R414	ERDS2TJ472	4.7K 1/4
R118	ERDS2TJ102	1K 1/4	R187	ERDS2TJ473	47K 1/4	R415	ERDS2TJ104	100K 1/4
R119	ERDS2TJ102	1K 1/4	R188	ERDS2TJ473	47K 1/4	R416	ERDS2TJ221	220 1/4
R120	ERDS2TJ120	12 1/4	R189	ERDS2TJ562	5.6K 1/4	R417	ERDS2TJ221	220 1/4
R121	ERDS2TJ393	39K 1/4	R190	ERDS2TJ123	12K 1/4	R418	ERDS2TJ221	220 1/4
R122	ERDS2TJ471	470 1/4	R191	ERDS2TJ154	150K 1/4	R419	ERDS2TJ221	220 1/4
R131	ERDS2TJ270	27 1/4	R192	ERDS2TJ824	820K 1/4	R420	ERDS2TJ221	220 1/4
R141	ERDS2TJ102	1K 1/4	R193	ERDS2TJ101	100 1/4	R421	ERDS2TJ221	220 1/4
R142	ERDS2TJ333	33K 1/4	R194	ERDS2TJ683	68K 1/4	R422	ERDS2TJ221	220 1/4
R143	ERDS2TJ124	120K 1/4	R195	ERDS2TJ103	10K 1/4	R423	ERDS2TJ221	220 1/4
R144	ERDS2TJ333	33K 1/4	R196	ERDS2TJ103	10K 1/4	R424	ERDS2TJ472	4.7K 1/4
R145	ERDS2TJ153	15K 1/4	R197	ERDS2TJ473	47K 1/4	R425	ERDS2TJ220	22 1/4
R146	ERDS2TJ122	1.2K 1/4	R198	ERDS2TJ473	47K 1/4	R426	ERDS2TJ472	4.7K 1/4
			R199	ERDS2TJ473	47K 1/4	R501	ERDS2TJ224	220K 1/4
			R301	ERDS2TJ121	120 1/4	R502	ERDS2TJ562	5.6K 1/4

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
R503	ERDS2TJ474	470K 1/4	C15	ECEA1CU332	3300 16	C187	ECEA1HKNR47	0.47 50
R504	ERDS2TJ221	220 1/4	C16	ECEA1CU332	3300 16	C301	ECFF1E104ZF	0.1 25
R505	ERDS2TJ104	100K 1/4	C17	ECEA1CU470	47 16	C302	ECFF1E104ZF	0.1 25
R506	ERDS2TJ333	33K 1/4	C18	ECEA1CU470	47 16	C304	ECFF1E104ZF	0.1 25
R507	ERDS2TJ102	1K 1/4	C19	ECEA0JS331	330 6.3	C307	ECCD1H220K	22P 50
R601	ERDS2TJ331	330 1/4	C20	ECEA0JS331	330 6.3	C308	ECCD1H070CC	7P 50
R602	ERDS2TJ472	4.7K 1/4	C21	ECFF1E104ZF	0.1 25	C309	ECFF1E104ZF	0.1 25
R603	ERDS2TJ472	4.7K 1/4	C22	ECFF1E104ZF	0.1 25	C310	ECFF1E104ZF	0.1 25
R604	ERDS2TJ472	4.7K 1/4	C23	ECEA0JS331	330 6.3	C311	ECFTD103KXL	0.01 25
R605	ERDS2TJ472	4.7K 1/4	C24	ECFTD103KXL	0.01 25	C312	ECFF1E104ZF	0.1 25
R606	ERDS2TJ472	4.7K 1/4	C25	ECFTD103KXL	0.01 25	C313	ECFF1E104ZF	0.1 25
R607	ERDS2TJ472	4.7K 1/4	C39	ECEA50V330V	330 50	C314	ECFF1E104ZF	0.1 25
R608	ERDS2TJ472	4.7K 1/4	C40	ECEA50V330V	330 50	C315	RCBS1H121KBY	120P 50
R609	ERDS2TJ472	4.7K 1/4	C53	ECEA1CU331	330 16	C316	RCBS1H391KBY	390P 50
R610	ERDS2TJ472	4.7K 1/4	C54	ECEA1CU331	330 16	C317	ECKD1H681K	680P 50
R611	ERDS2TJ472	4.7K 1/4	C55	ECEA1CU221	220 16	C351	ECKD1H102KB	0.001 50
R612	ERDS2TJ472	4.7K 1/4	C56	ECEA1CU221	220 16	C352	ECKD1H102KB	0.001 50
R613	ERDS2TJ472	4.7K 1/4	C57	ECFTD103KXL	0.01 25	C353	ECKD1H102KB	0.001 50
R614	ERDS2TJ472	4.7K 1/4	C58	ECFTD103KXL	0.01 25	C401	ECFF1E104ZF	0.1 25
R615	ERDS2TJ472	4.7K 1/4	C59	ECEA1AU101	100 10	C402	ECEA0JK470	47 6.3
R616	ERDS2TJ105	1M 1/4	C60	ECEA1AU101	100 10	C403	ECFF1E104ZF	0.1 25
R826	ERDS2TJ104	100K 1/4	C83	ECEA1AU101	100 10	C405	ECFF1E104ZF	0.1 25
R831	ERDS2TJ102	1K 1/4	C84	ECEA1AU101	100 10	C501	ECQM1H104JZP	0.1 50
R832	ERDS2TJ102	1K 1/4	C87	ECEA1CU101	100 16	C502	ECFF1E104ZF	0.1 25
R833	ERDS2TJ102	1K 1/4	C88	ECEA1CU101	100 16	C503	ECQV1H104JZ	0.1 50
R834	ERDS2TJ102	1K 1/4	C101	ECQV1H104JZ	0.1 50	C504	ECFF1E104ZF	0.1 25
R835	ERDS2TJ103	10K 1/4	C102	ECKD1H102KB	0.001 50	C505	ECFF1E104ZF	0.1 25
R836	ERDS2TJ102	1K 1/4	C103	ECKD1H102KB	0.001 50	C506	ECCD1H150KC	15P 50
R837	ERDS2TJ102	1K 1/4	C104	ECKD1H681K	680P 50	C507	ECKD1H102KB	0.001 50
R838	ERDS2TJ102	1K 1/4	C105	ECKD1H471KB	470P 50	C508	RBP1CN100CT	10 16
R839	ERDS2TJ562	5.6K 1/4	C106	ECKD1H471KB	470P 50	C509	ECCD1H100KC	10P 50
R840	ERDS2TJ562	5.6K 1/4	C107	ECCD1H220K	22P 50	C510	ECQM1H104JZP	0.1 50
R841	ERDS2TJ152	1.5K 1/4	C108	ECEA1HK0R1	0.1 50	C511	ECEA1HUR47	0.47 50
R842	ERDS2TJ152	1.5K 1/4	C109	ECEA1HK010	1 50	C512	ECKD1H681K	680P 50
R843	ERDS2TJ103	10K 1/4	C110	ECQV1H104JZ	0.1 50	C513	ECKD1H681K	680P 50
R844	ERDS2TJ103	10K 1/4	C111	ECEA1HK100	10 50	C514	ECQM1H154JZ	0.15 50
R845	ERDS2TJ154	150K 1/4	C112	ECEA1HK100	10 50	C515	ECQM1H153JZ	0.015 50
R846	ERDS2TJ154	150K 1/4	C113	ECEA1HK010	1 50	C516	ECEA1HKN2R2	2.2 50
R847	ERDS2TJ682	6.8K 1/4	C114	RCBS1C182MXY	0.0018 16	C517	ECKD1H471KB	470P 50
R848	ERDS2TJ682	6.8K 1/4	C115	ECKD1H682KB	0.0068 50	C518	ECKD1H472KB	0.0047 50
R849	ERDS2TJ183	18K 1/4	C116	ECQM1H333JZ	0.033 50	C601	RCBS1C103MYY	0.01 16
R850	ERDS2TJ183	18K 1/4	C117	RCBS1H221KBY	220P 50	C602	ECEA1CKS100	10 16
R851	ERDS2TJ271	270 1/4	C118	ECEA1HK010	1 50	C801	ECEA0JS331	330 6.3
R852	ERDS2TJ271	270 1/4	C119	ECEA0JK220	22 6.3	C802	ECEA0JS331	330 6.3
R853	ERDS2TJ271	270 1/4	C120	RCBS1H681KBY	680P 50	C803	ECEA0JS331	330 6.3
R854	ERDS2TJ271	270 1/4	C121	ECFTD103KXL	0.01 25	C804	ECEA0JS331	330 6.3
R855	ERDS2TJ473	47K 1/4	C122	ECBT1H101KB5	100P 50	C805	ECKD1H271KB	270P 50
R856	ERDS2TJ473	47K 1/4	C123	ECBT1H101KB5	100P 50	C806	ECKD1H271KB	270P 50
R857	ERDS2TJ154	150K 1/4	C124	ECKD1H222KB	0.0022 50	C807	ECFTD103KXL	0.01 25
R858	ERDS2TJ154	150K 1/4	C125	ECEA0JK470	47 6.3	C808	ECFTD103KXL	0.01 25
R859	ERDS2TJ121	120 1/4	C126	ECEA0JK470	47 6.3	C809	ECFTD103KXL	0.01 25
R860	ERDS2TJ121	120 1/4	C127	ECKD1H102KB	0.001 50	C810	ECFTD103KXL	0.01 25
R861	ERDS2TJ564	560K 1/4	C128	ECKD1H102KB	0.001 50	C811	ECFTD103KXL	0.01 25
R862	ERDS2TJ564	560K 1/4	C129	ECKD1H681K	680P 50	C812	ECFTD103KXL	0.01 25
R865	ERDS2TJ473	47K 1/4	C131	ECEA0JK221	220 6.3	C813	ECKD1H102KB	0.001 50
R866	ERDS2TJ223	22K 1/4	C141	ECQM1H153JZ	0.015 50	C814	ECKD1H102KB	0.001 50
R871	ERDS2TJ103	10K 1/4	C142	ECQM1H122JZ	0.0012 50	C815	ECKD1H181KB	180P 50
R872	ERDS2TJ103	10K 1/4	C143	ECQM1H473JZ	0.047 50	C816	ECKD1H181KB	180P 50
R873	ERDS2TJ123	12K 1/4	C144	ECEA1HKN2R2	2.2 50	C817	ECEA1AN330B	33 10
R874	ERDS2TJ123	12K 1/4	C145	ECEA1HKNR22	0.22 50	C818	ECEA1AN330B	33 10
R875	ERDS2TJ104	100K 1/4	C146	ECFTD103KXL	0.01 25	C819	ECKD1H102KB	0.001 50
R876	ERDS2TJ104	100K 1/4	C161	ECQM1H153JZ	0.015 50	C820	ECKD1H102KB	0.001 50
R885	ERDS2TJ222	2.2K 1/4	C162	ECKD1H681K	680P 50	C821	ECEA0JU471	470 6.3
R886	ERDS2TJ222	2.2K 1/4	C163	ECQM1H103JZ	0.01 50	C822	ECEA1CU470	47 16
R887	ERDS2TJ680	68 1/4	C164	ECEA1HKN3R3	3.3 50	C823	ECEA1CU470	47 16
R888	ERDS2TJ680	68 1/4	C165	ECEA1HKN0R1	0.1 50	C824	ECEA1HKN2R2	2.2 50
R889	ERDS2TJ470	47 1/4	C168	ECEA1CKN100	10 16	C825	ECEA0JK220	22 6.3
R890	ERDS2TJ470	47 1/4	C169	ECFTD103KXL	0.01 25	C871	ARA1EN3R3M0	3.3 25
CAPACITORS(VALUE,VOLTAGE)			C170	ECFTD103KXL	0.01 25	C872	ARA1EN3R3M0	3.3 25
C1 ⚠	ECKDKC103PF2	0.01 125	C181	ECQM1H474JZ	0.47 50	C873	ECQM1H103KF	0.01 50
C11 ⚠	ECFTD103KXL	0.01 25	C182	RCBS1H221KBY	220P 50	C874	ECQM1H103KF	0.01 50
C12 ⚠	ECFTD103KXL	0.01 25	C183	ECQM1H682JZ	0.0068 50	C875	ECFTD103KXL	0.01 25
C14	ECFF1E104ZF	0.1 25	C184	ECEA1HKN010	1 50	C876	ECFTD103KXL	0.01 25
			C186	ECQM1H224JZ	0.22 50	C878	ECFTD103KXL	0.01 25
						C879	ECFTD103KXL	0.01 25

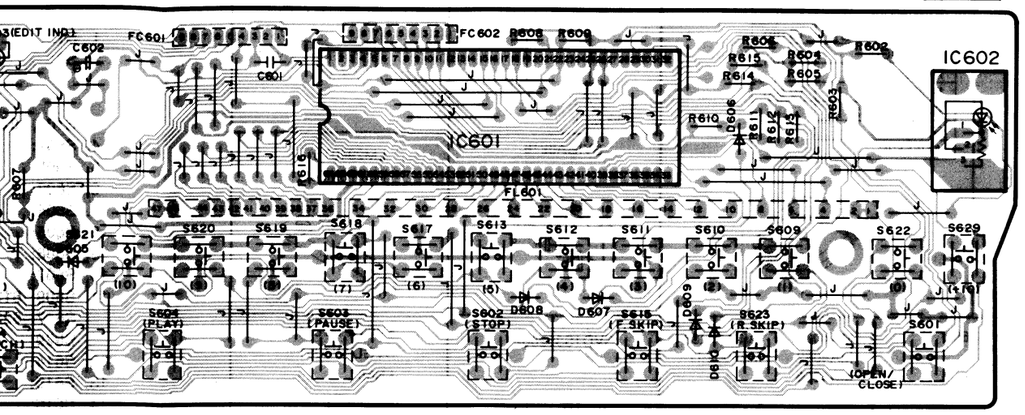
■ PRINTED CIRCUIT BOARDS

B MAIN P.C.B.

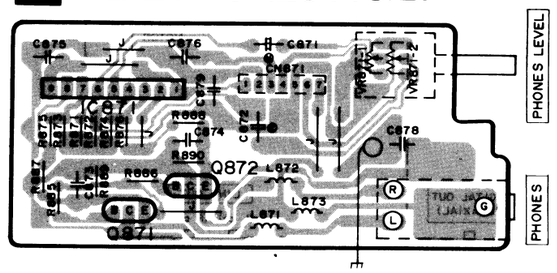


13 14 15 16 17 18 19 20 21 22 23 24 25

REMOTE SENSOR

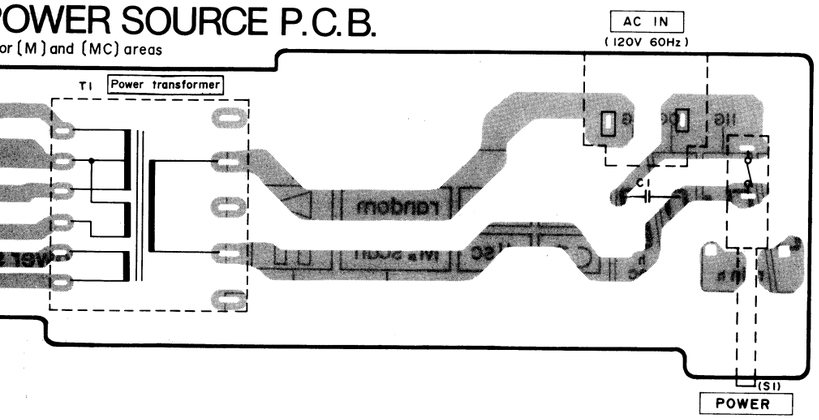


D HEADPHONES P.C.B.

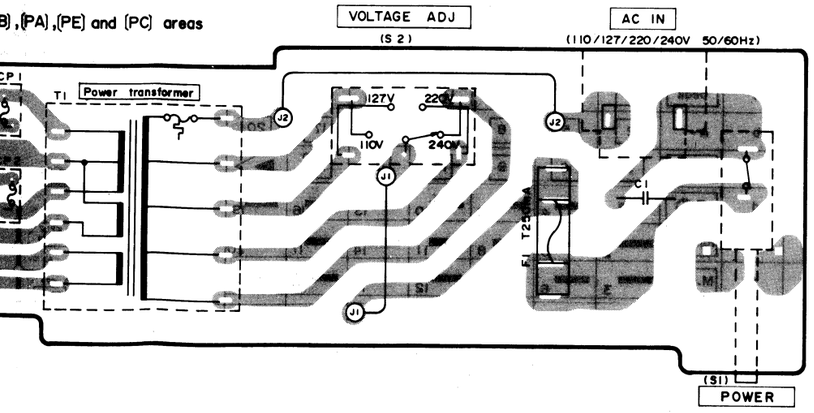


POWER SOURCE P.C.B.

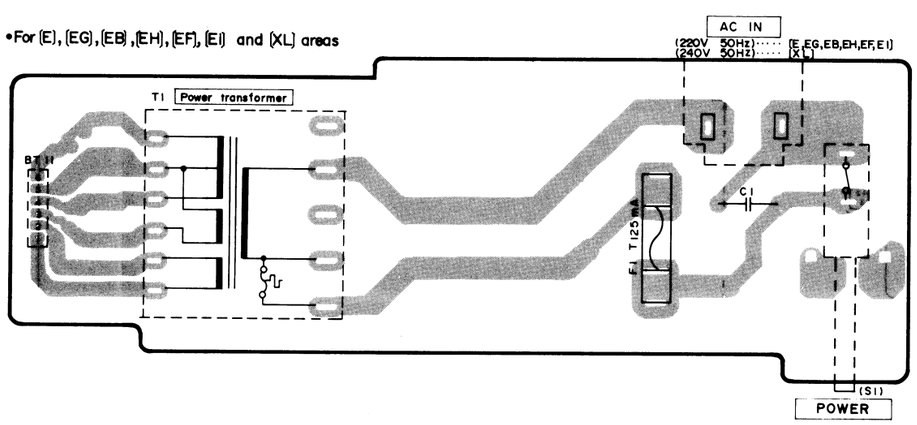
For (M) and (MC) areas



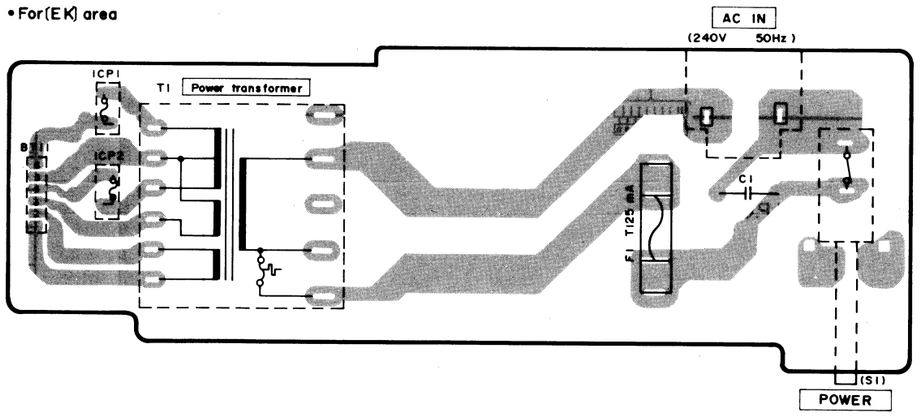
For (B), (PA), (PE) and (PC) areas



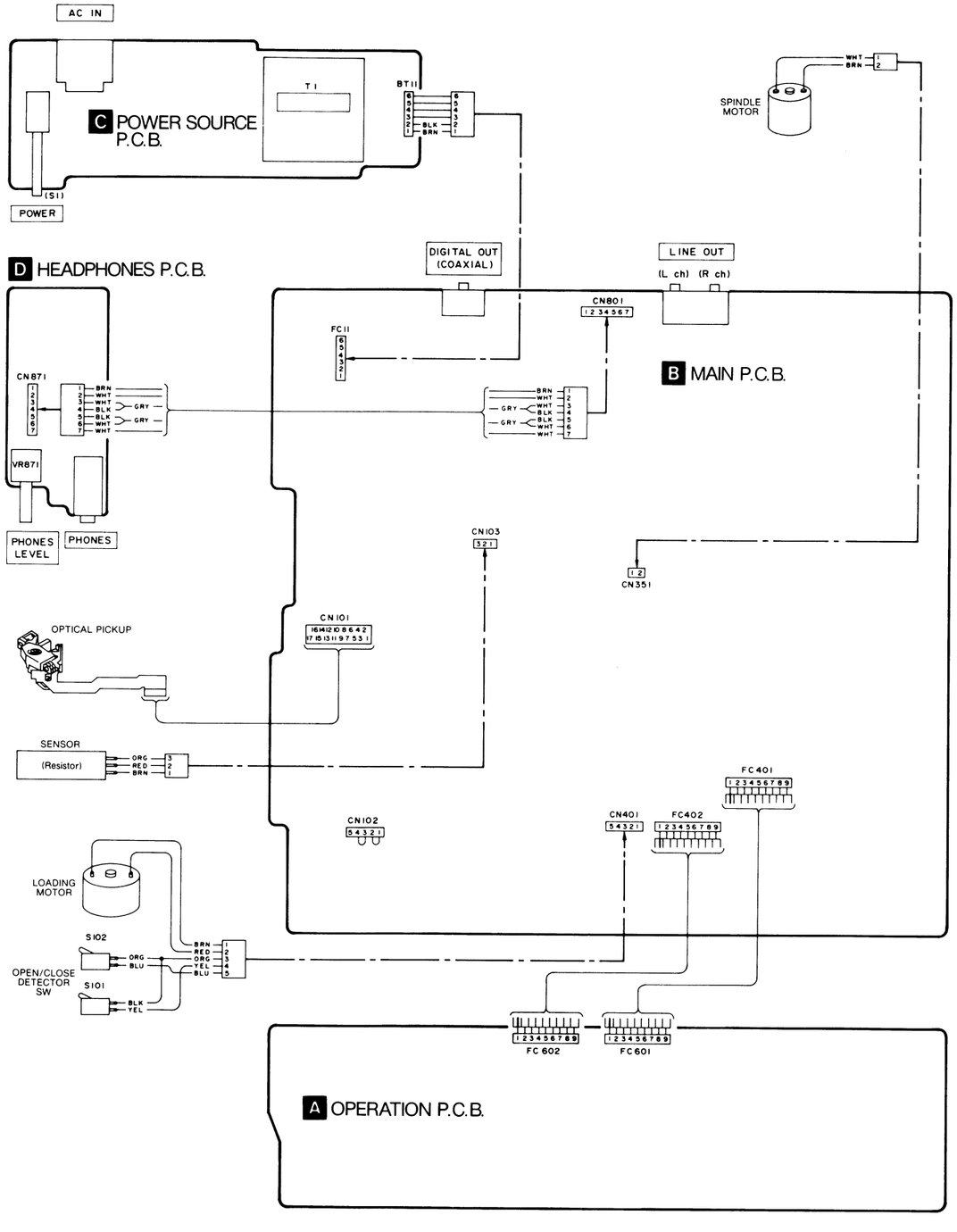
•For (E), (EG), (EB), (EH), (EF), (EI) and (XL) areas



• For (EK) area



■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



■ TERMINAL GUIDE OF TRANSISTORS, IC'S AND DIODES

MN15283PEE	64 pin
MN1554PEF	
MN6030	22 pin
PCM56P-J	16 pin
YM3404B	

No 1

AN8370	42 pin
AN8371	24 pin
SVICXK5816M	
SVIUPD4053G1	16 pin
MN74HC00	14 pin
AN6554NS	
MN6636S	10 pin
SVINJM5532	8 pin
SVIM5219	
AN6552S	

No 1

MN6622 ..... 84 pin
MN53010PEH ..... 42 pin

Mark No. 1

SVINJM4556SA

1 9

SVIBA6218

1 9

LM2940T5
M5F78M08L

1 2 3
1 Vin
2 GND
3 Vout

MA154WK

Ca A Ca
Ca Ca
A

MA165

A
Ca
Ca A

MA4033 SVDMTZ33
MA4082 MA4062-H
MA4056

A
Ca
Ca A

SVD1S35200A

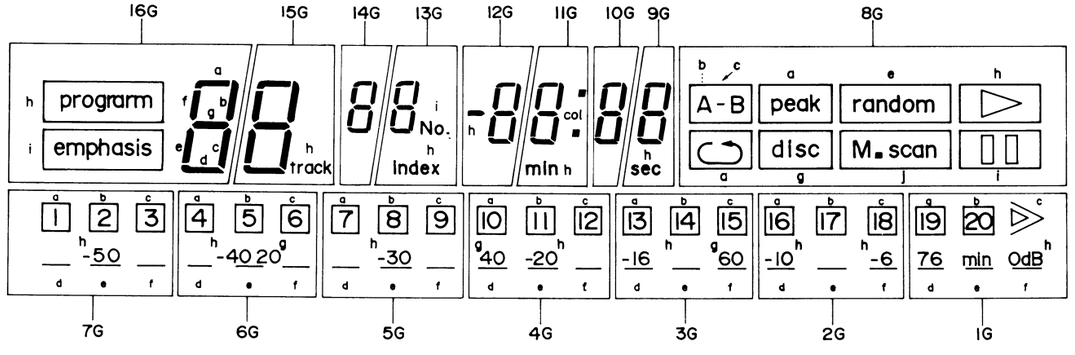
Ca A
Ca A

SVGDPG7851Y
SVGDAY7851
LN66

A Ca A Ca

■ INTERNAL CONNECTIONS OF FL

•Grid connection diagram



•Anode connection table

	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	a	a	peak	1	4	7	10	13	16	19
b	b	b	b	b	b	b	b	b	A-	2	5	8	11	14	17	20
c	c	c	c	c	c	c	c	c	B	3	6	9	12	15	18	▶▶
d	d	d	d	d	d	d	d	d	↻	— 1	— 4	— 7	— 10	— 13	— 16	— 19
e	e	e	e	e	e	e	e	e	random	— 2	— 5	— 8	— 11	— 14	— 17	— 20
f	f	f	f	f	f	f	f	f	M.scan	— 3	— 6	— 9	— 12	— 15	— 18	— 21
g	g	g	g	g	g	g	g	g	disc	-	20	-	40	60	-	76 min
h	program	track	-	index	—	min	-	sec	▶	-50	-40	-30	-20	-16	-10 -6	0 dB
i	emphasis	-	-	No.	-	col	-	-	❚❚	-	-	-	-	-	-	-

■ SCH

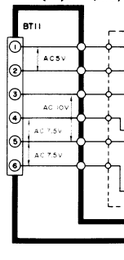
(This schemati
development o

Notes:

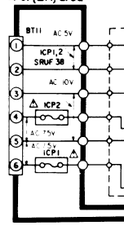
1. **S1:**
2. **S2:**
3. **S101, 102:**
4. **S601:**
5. **S602:**
6. **S603:**
7. **S604:**
8. **S605:**
9. **S606:**
10. **S607:**
11. **S609~613**
    S617~622
    S629:
12. **S614:**
13. **S615:**
14. **S616:**
15. **S623:**
16. **S624:**
17. **S625:**
18. **S626:**
19. **S627:**
20. **S628:**
21. **S631:**
22. **S634:**

•Power su

•For (M) and (MC)



•For (EK) area



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

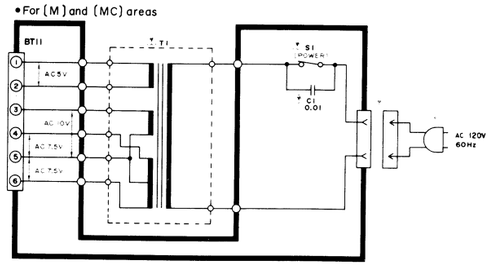
1. **S1:** Power switch in **"on"** position.
2. **S2:** Voltage selector switch. (For [XA], [XB], [PA], [PE] and [PC] areas.)
3. **S101, 102:** Disc holder open/close detection switch.
4. **S601:** Open/close switch.
5. **S602:** Stop switch.
6. **S603:** Pause switch.
7. **S604:** Play switch.
8. **S605:** Program switch.
9. **S606:** Recall switch.
10. **S607:** Time mode switch.
11. **S609~613, S617~622, S629:** Numeric switch.
12. **S614:** Clear switch.
13. **S615:** Forward skip switch.
14. **S616:** Forward search switch.
15. **S623:** Reverse skip switch.
16. **S624:** Reverse search switch.
17. **S625:** Side A/B switch.
18. **S626:** Edit switch.
19. **S627:** Auto peak switch.
20. **S628:** Display switch.
21. **S631:** A-B Repeat switch.
22. **S634:** Repeat switch.
23. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit. *The parenthesized are the values of voltage generated during playing (Test disc 1 kHz, L+R, 0 dB), others are voltage values in stop mode.
24. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
25. ———: Positive voltage lines. - - - - -: Negative voltage lines. ·····: Audio signal lines.

***Caution!**

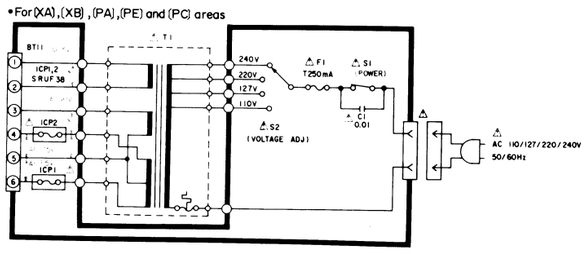
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
*Cover the parts boxes made of plastics with alminum foil.
*Ground the soldering iron.
*Put a conductive mat on the work table.
*Do not touch the legs of IC or LSI with the fingers directly.

●Power supply circuit

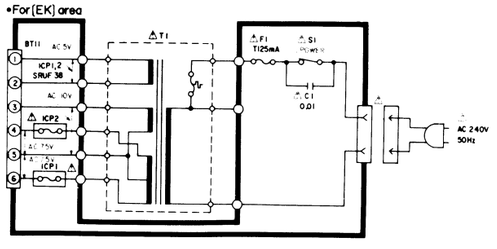
*For (M) and (MC) areas



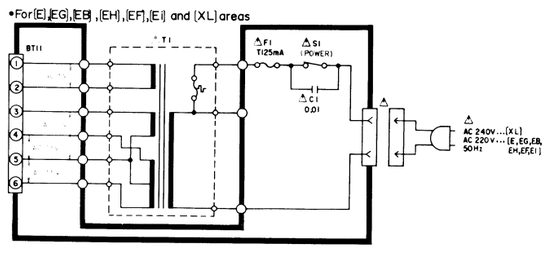
*For (XA), (XB), (PA), (PE) and (PC) areas



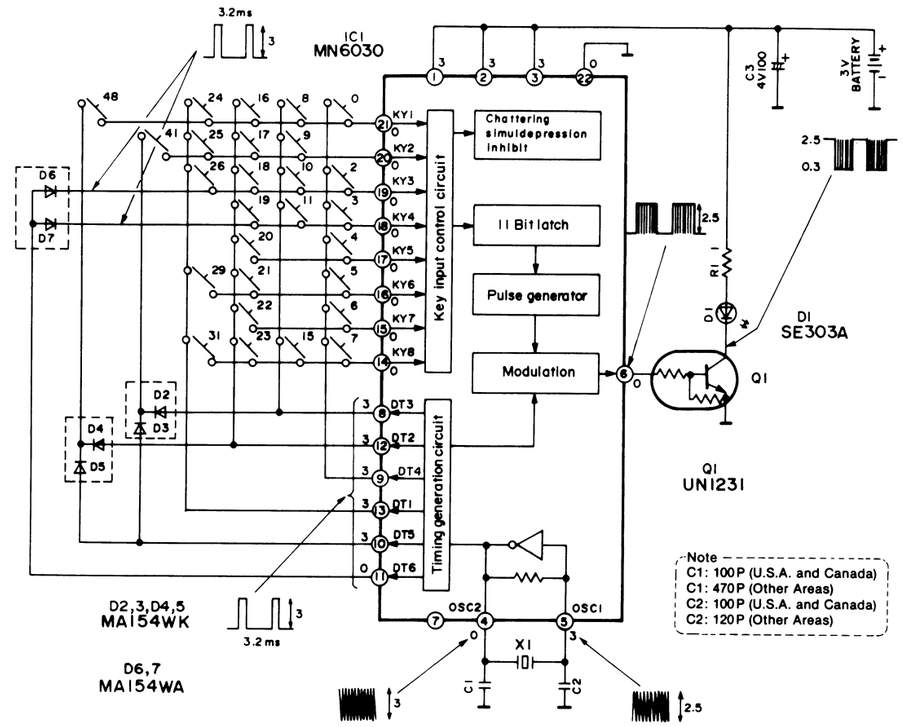
*For [EK] area



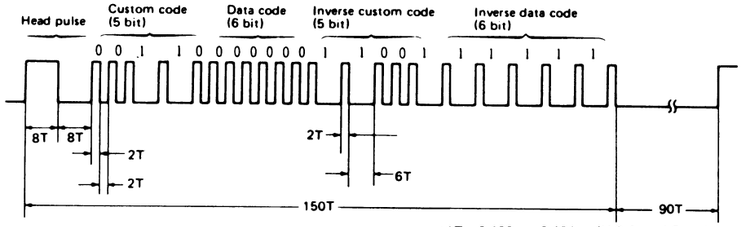
*For [E], [EG], [EB], [EH], [EF], [EI] and [XL] areas



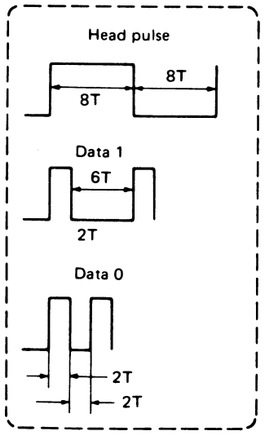
• Remote control unit



• Remote control data code



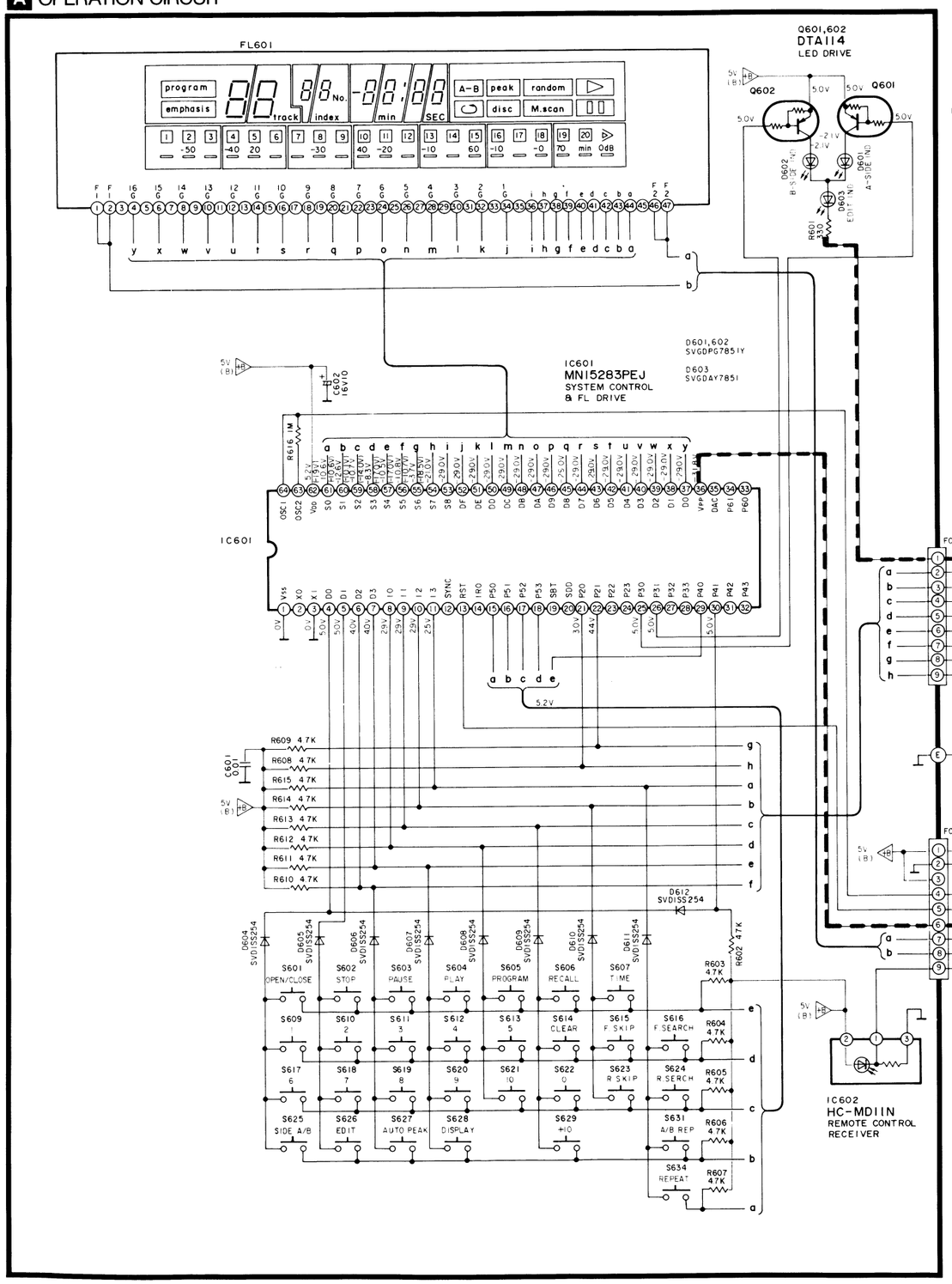
*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



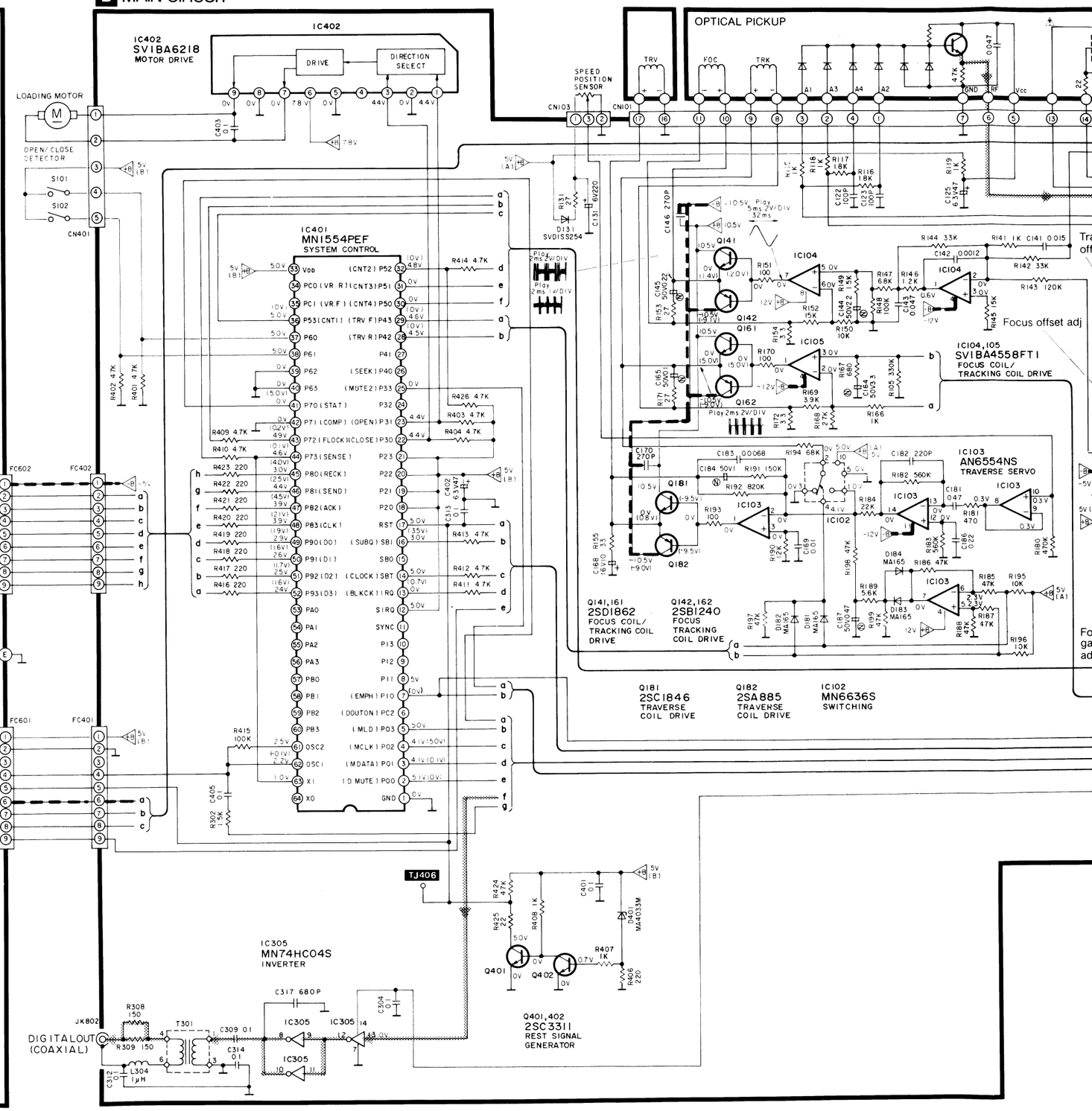
Key No.	Function	Data Code
16	1	010000
17	2	010001
18	3	010010
19	4	010011
20	5	010100
21	6	010101
22	7	010110
23	8	010111
24	9	011000
25	0	011001
26	+10	011010
41	time	101001
0	stop	000000

Key No.	Function	Data Code
11	clear	001011
8	A-B repeat	001000
7	repeat	000111
15	M scan	001111
9	recall	001001
4	◀◀ search	000100
5	search ▶▶	000101
2	⏮ skip	000010
3	skip ⏭	000011
6	⏸ pause	000110
10	◀ play	001010
29	Program	011101
31	random	011111

A OPERATION CIRCUIT



B MAIN CIRCUIT



OPTICAL PICKUP

Best eye (P.D. balance) adj

Tracking balance adj

Tracking offset adj

Focus offset adj

Tracking gain adj

Focus gain adj

PLL adj

IC101 AN8370S OPTICAL SERVO

Q101 2SC4010 AUTO POWER CONTROL

IC104,105 SVIBA4558FTI FOCUS COIL/ TRACKING COIL DRIVE

IC103 AN6554NS TRAVERSE SERVO

Q142,162 2SB1240 FOCUS TRACKING COIL DRIVE

Q182 2SA885 TRAVENSE COIL DRIVE

IC102 MN6636S SWITCHING

Q501 DTA124 SWITCHING

IC501 AN8371S DATA SLICE & PLL

IC301 MN6622 E.FM DECODER ERROR CORRECTION & CLV SERVO

16K RAM

IC303 CXK5816M 16K RAM

IC305 MN74HC04S INVERTER

IC302 YM3404B DIGITAL FILTER

IC801,802 PCM56P D/A CONVERTER

Q11 2SD1862 REGULATOR

Q17 2SB1238 REGULATOR

IC11 LM2940T5 REGULATOR

IC12 SVIBA4558FTI STABILIZER

Q12 2SB1240 REGULATOR

Q20 2SD1862 REGULATOR

Q13 2SD1762 REGULATOR

Q21 2SB1240 REGULATOR

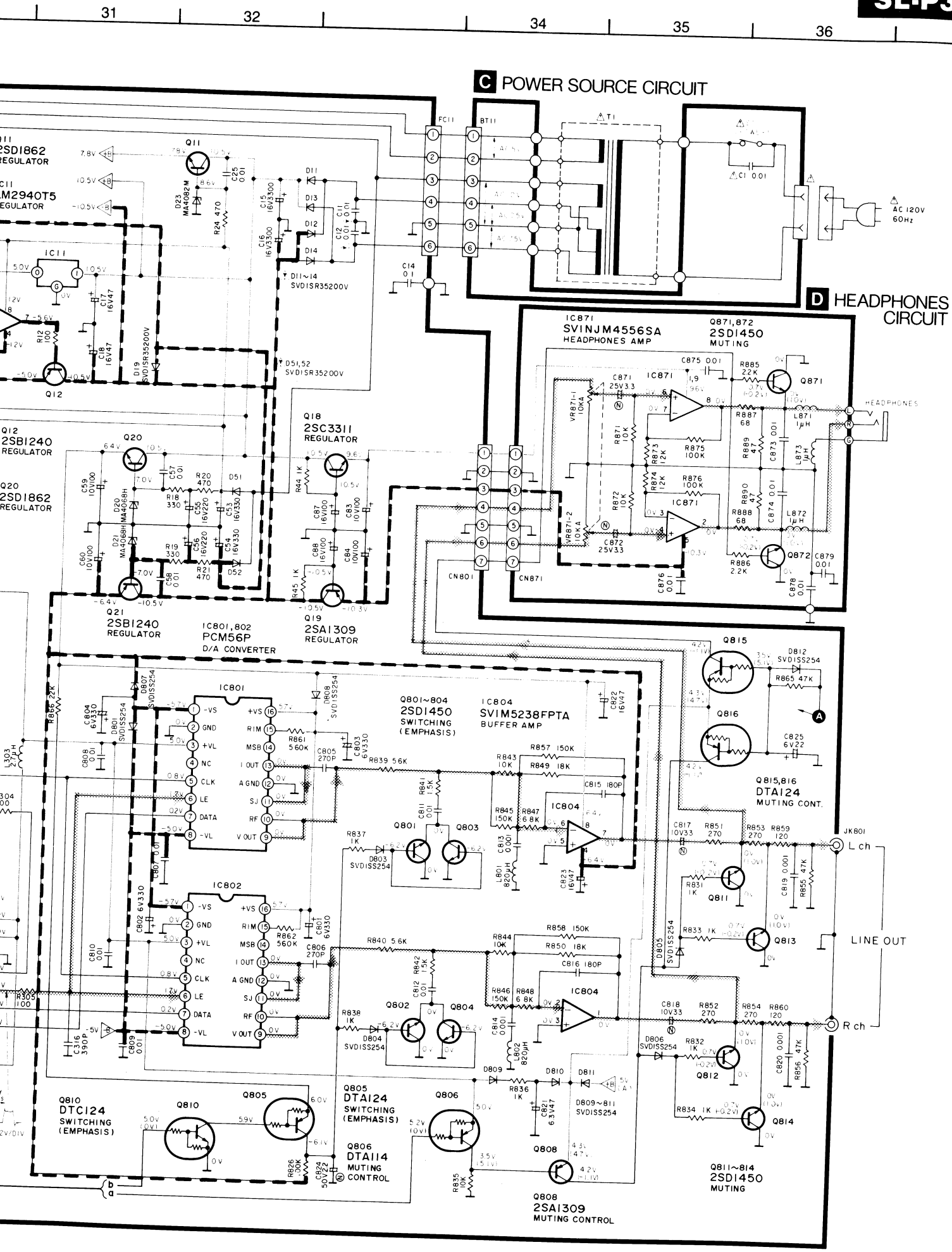
Q352 2SD1862 MOTOR DRIVE

IC12 SVIBA4558FTI MOTOR CONT.

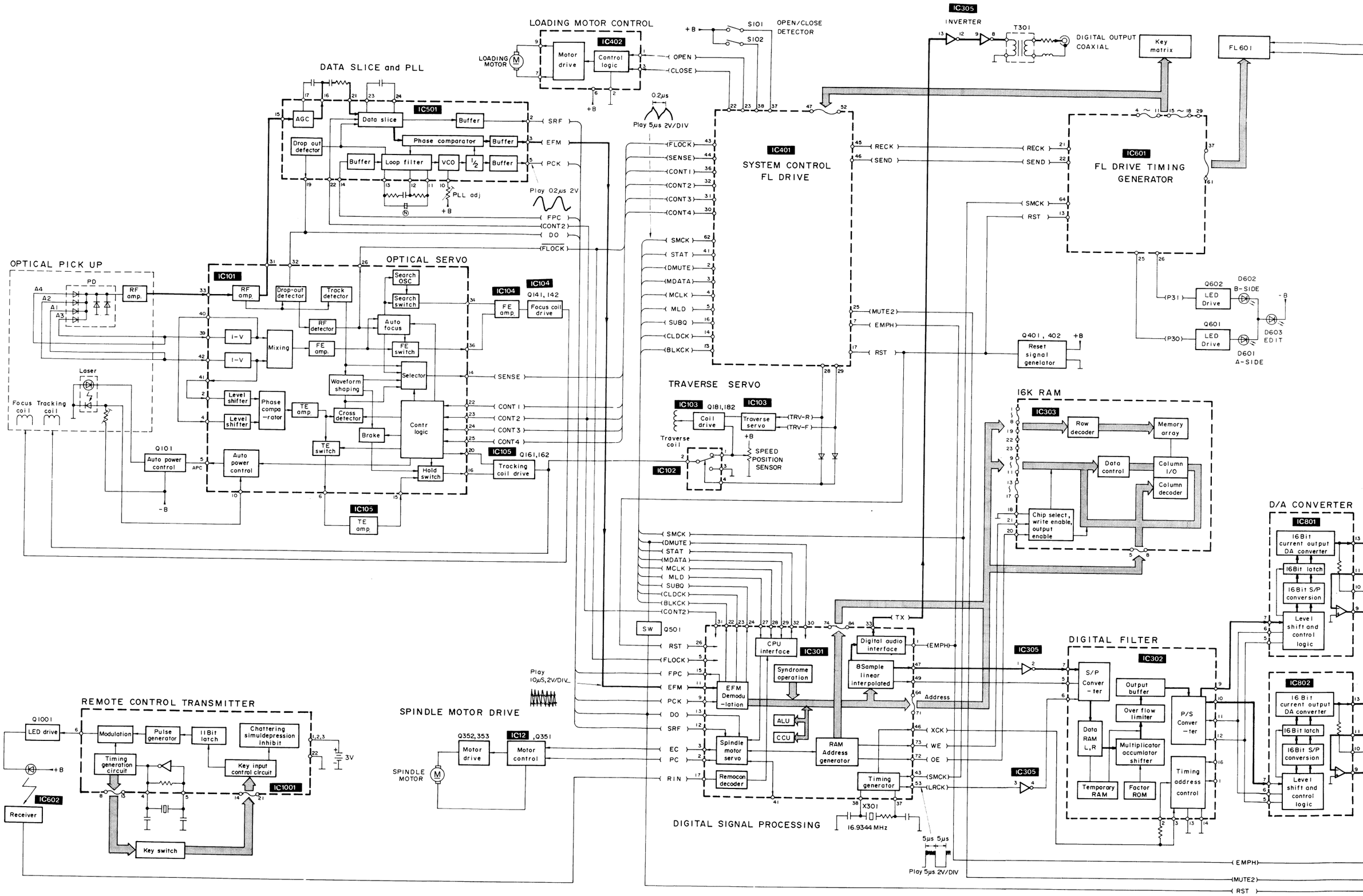
Q351 DTA124 MOTOR CONT.

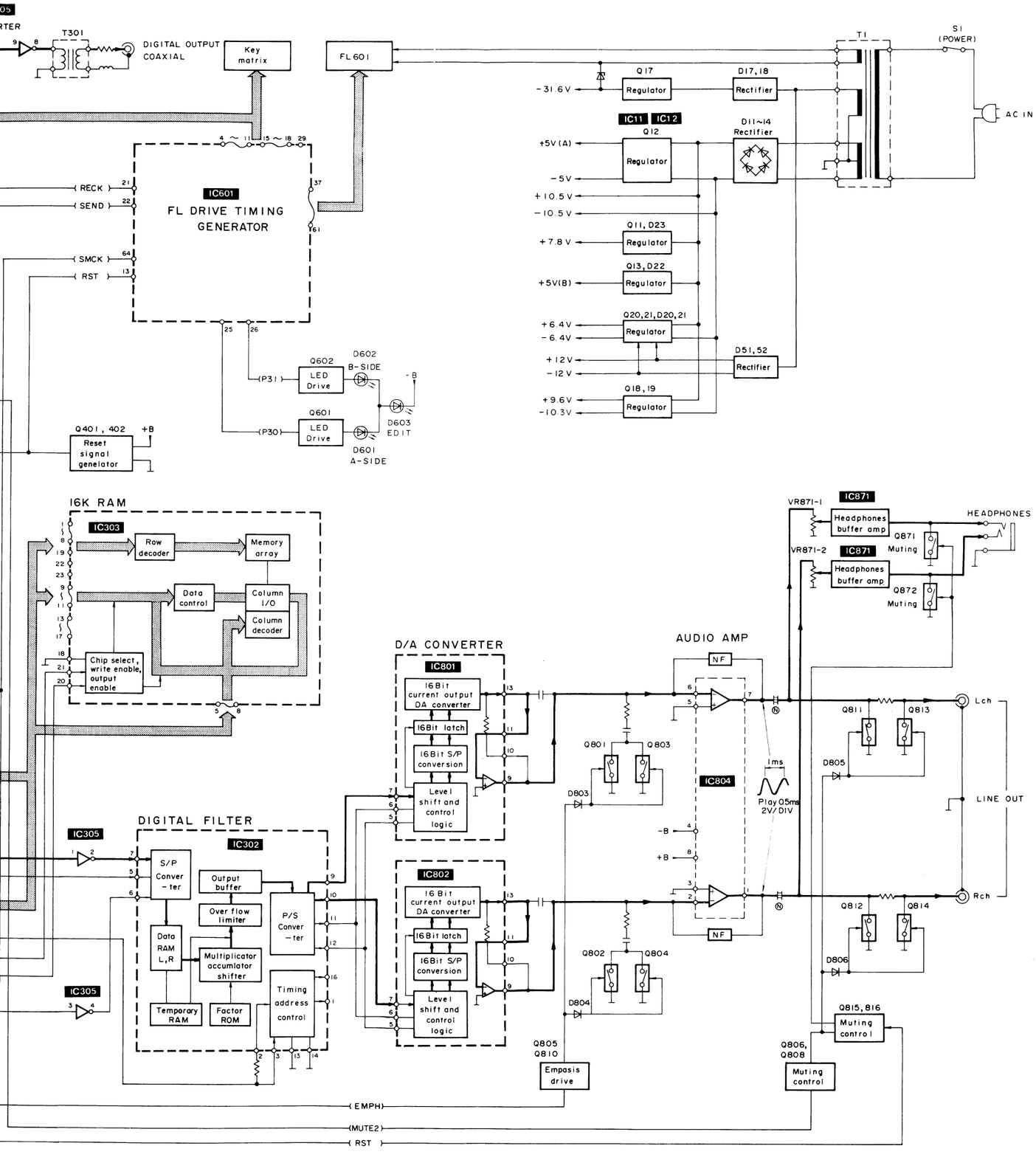
Q353 2SB1240 MOTOR DRIVE

Q810 DTC124 SWITCHING (EMPHASIS)


C POWER SOURCE CIRCUIT
D HEADPHONES CIRCUIT
IC871
SVINJM4556SA
HEADPHONES AMP
Q871,872
2SD1450
MUTING
IC801,802
PCM56P
D/A CONVERTER
Q801~804
2SD1450
SWITCHING
(EMPHASIS)
IC804
SVIM5238FPTA
BUFFER AMP
Q815,816
DTA124
MUTING CONT.
Q805
DTA124
SWITCHING
(EMPHASIS)
Q806
DTA114
MUTING
CONTROL
Q810
DTC124
SWITCHING
(EMPHASIS)
Q811~814
2SD1450
MUTING
Q808
2SA1309
MUTING CONTROL
Q11
2SD1862
REGULATOR
IC11
M2940T5
REGULATOR
Q12
2SB1240
REGULATOR
Q20
2SD1862
REGULATOR
Q18
2SC3311
REGULATOR
Q21
2SB1240
REGULATOR
Q19
2SA1309
REGULATOR
D11~14
SVDISR35200V
D51,52
SVDISR35200V
AC 120V
60Hz
HEADPHONES
L ch
R ch
LINE OUT

■ BLOCK DIAGRAM




T301
DIGITAL OUTPUT COAXIAL
Key matrix
FL601
T1
S1 (POWER)
AC IN
Q17
Regulator
-31.6V
D17,18
Rectifier
IC11 IC12
Q12
Regulator
+5V(A)
-5V
+10.5V
-10.5V
D11~14
Rectifier
Q11, D23
Regulator
+7.8V
Q13, D22
Regulator
+5V(B)
Q20,21,D20,21
Regulator
+6.4V
-6.4V
+12V
-12V
D51,52
Rectifier
Q18,19
Regulator
+9.6V
-10.3V
IC601
FL DRIVE TIMING GENERATOR
RECK
SEND
SMCK
RST
Q602
LED Drive
D602
B-SIDE
Q601
LED Drive
D603
EDIT
D601
A-SIDE
-B
Q401, 402
Reset signal genelator
+B
16K RAM
IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable
D/A CONVERTER
IC801
16Bit current output DA converter
16Bit latch
16Bit S/P conversion
Level shift and control logic
IC802
16 Bit current output DA converter
16Bit latch
16Bit S/P conversion
Level shift and control logic
AUDIO AMP
NF
IC804
Q801
Q803
D803
Q802
Q804
D804
1ms
Play 05ms 2V/DIV
-B
+B
DIGITAL FILTER
IC305
IC302
S/P Conver-ter
Output buffer
Over flow limiter
P/S Conver-ter
Data RAM L,R
Multiplicator accumulator shifter
Timing address control
Temporary RAM
Factor ROM
IC305
VR871-1
VR871-2
IC871
Headphones buffer amp
Headphones buffer amp
HEADPHONES
Q871
Muting
Q872
Muting
Q811
Q813
D805
Q812
Q814
D806
Lch
Rch
LINE OUT
Q815, 816
Muting control
Q806, Q808
Muting control
Q805 Q810
Empasis drive
EMPH
MUTE2
RST

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DEUTSCH

ELEKTRISCHE JUSTIERUNG

Meßinstrumente und Spezialwerkzeuge
- Servo-Verstärkungs-Justierer (SZZP1017F)
- Testplatten
  Testplatte (SZZP1014F) alter oder neuer Typ
  Inspektions-Testplatte (SZZP1054C)
  Ungleichmäßige Platte (SZZP1056C)
  Schwarzbandplatte (SZZP1057C)
- Gewöhnliche Platte
- Zweikanal-Oszilloskop (mit Trigger) von 30 MHz oder mehr
- Niederfrequenz-Oszillator
- Zwischenstecker (SZZP1032F)

Justierverfahren

Schritt 1: Das Gehäuse entfernen.

Schritt 2: Die einzelnen Regelwiderstände provisorisch einstellen.

Schritt 3: Beste Augen-(PD-Balance)-Justierung

Schritt 4: Den Servo-Verstärkungs-Justierer anschließen.

Schritt 5: Fokus-Verstärkungs-Justierung

Schritt 6: Spurlagen-Verstärkungs-Justierung

Schritt 7: Fokus-Offset-Justierung

Schritt 8: Spurlagen-Offset-Justierung

Schritt 9: Spurlagen-Offset-Balance-Justierung

Schritt 10: Den Servo-Verstärkungs-Justierer abtrennen.

Schritt 11: PLL-Justierung

Schritt 12: Nach der Justierung den Betrieb prüfen.

PROVISORISCHE JUSTIERUNG DER EINZELNEN REGELWIDERSTÄNDE

Hinweis:
Wenn bei einer Platte Überspringungen auftreten oder Wiedergabe nicht möglich ist, die einzelnen Regelwiderstände wie abgebildet provisorisch einstellen.

BESTE AUGEN-(PD-BALANCE)-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV
   KIPP .....0,5 μsec.
   EINGANG .....Wechselstrom
2. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. **VR101** so justieren, daß das Augenmuster des HF-Signals maximal gestreckt ist.
5. Den Netzschalter des Spielers ausschalten.

FOKUS-VERSTÄRKUNGS-JUSTIERUNG

1. Den Servo-Verstärkungs-Justierer anschließen.
2. Den Wahlschalter des Servo-Verstärkungs-Justierers auf **2** und den ON-OFF-Schalter auf **ON** stellen.
3. Den Niederfrequenz-Oszillator auf eine Frequenz von **750 Hz** und eine Ausgangsspannung von **100 mVs-s** einstellen. Dann den Oszillator an **OSC** (+) und **GND** (−) des Servo-Verstärkungs-Justierers anschließen.
4. Kanal 1 und Kanal 2 des Oszilloskops an **TP1** und **TP2** des Servo-Verstärkungs-Justierers anschließen. (**TP3** ist die Masseklemme.)
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
5. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
6. Den Spieler auf Wiedergabe schalten.
7. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"3"** stellen.
8. Auf dem Oszilloskop werden **750 Hz**-Signale angezeigt. **VR104** justieren, bis die Wellenform-Amplituden beider Kanäle identisch sind.
9. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"3"** auf **"2"** stellen.

SPURLAGEN-VERSTÄRKUNGS-JUSTIERUNG

1. Die Oszilloskop-Einstellung und der Anschluß sind die gleichen wie oben.
2. Den Niederfrequenz-Oszillator auf eine Frequenz von **1,0 kHz** und eine Ausgangsspannung von **100 mVs-s** stellen.
3. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"1"** stellen.
4. Auf dem Oszilloskop werden **1,0 kHz**-Signale angezeigt. **VR102** justieren, bis die Wellenform-Amplituden beider Kanäle identisch sind.
5. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"1"** auf **"2"** stellen.
6. Den Netzschalter des Spielers ausschalten.

FOKUS-OFFSET-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Kanal 2 des Oszilloskops an **TJ102** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom (Kanal 1), Gleichstrom (Kanal 2)
   BETRIEBSART ....NORM (Schaltgriff auf Kanal 1)
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1057C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. Die Wellenform von Kanal 1 und Kanal 2 auf dem Oszilloskop prüfen und **VR105** so justieren, daß die Wellenform um den Triggerpunkt so wie in der Abbildung wird.

SPURLAGEN-OFFSET-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Kanal 2 des Oszilloskops an **TJ101** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom (Kanal 1), Gleichstrom.(Kanal 2)
   BETRIEBSART ....NORM (Schaltgriff auf Kanal 1)
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1057C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. Die Wellenform von Kanal 1 und Kanal 2 auf dem Oszilloskop prüfen und **VR103** so justieren, daß die Wellenform um den Triggerpunkt so wie in der Abbildung wird.

SPURLAGEN-OFFSET-BALANCE-JUSTIERUNG

1. Den Niederfrequenz-Oszillator auf eine Frequenz von **1 kHz** und eine Ausgangsspannung von **200 mVs-s** einstellen. Dann den Oszillator an **OSC** (+) und **GND** (−) des Servo-Verstärkungs-Justierers anschließen.
2. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom
3. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
4. Den Spieler auf Wiedergabe schalten.
5. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"1"** stellen.
6. **VR106** so justieren, daß die Ausgangs-Wellenform wie abgebildet wird (Jitter ist minimiert).
7. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"1"** auf **"2"** stellen.
8. Den Netzschalter des Spielers ausschalten.
9. Den Servo-Verstärkungs-Justierer abtrennen und den Kurzschlußstecker von CN102 an der ursprünglichen Position einstecken.

PLL-JUSTIERUNG

1. Kanal 1 des Oszilloskops an die **LINE OUT-Buchse** (entweder linker oder rechter Kanal) und an **Masse** anschließen.
   Oszilloskop-Einstellung:
   VOLT .....1 V
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1054C) einsetzen.
3. **Spur Nr. 6 (Keil 0,7 mm)** der Testplatte abspielen.
4. Die auf dem Oszilloskop angezeigte Wellenform prüfen und **VR501** in den folgenden Schritten justieren.
   Schritt 1. **VR501** langsam im Uhrzeigersinn drehen und den Punkt beobachten, an dem die Wellenform auf dem Oszilloskop anfängt zu verzerren.
   Schritt 2. **VR501** langsam entgegen dem Uhrzeigersinn drehen und den Punkt beobachten, an dem die Wellenform auf dem Oszilloskop anfängt zu verzerren.
   Schritt 3. **VR501** auf die Mitte zwischen den in den obigen Schritten **"1"** und **"2"** beobachteten Punkten einstellen.

PRÜFUNG DES WIEDERGABEBETRIEBS NACH DER JUSTIERUNG

Prüfung des Überspring-Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Skip-Taste drücken, um den Überspring-Suchlauf zu prüfen (in Vorwärts- und Rückwärtsrichtung).

Prüfung des manuellen Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Taste für manuellen Suchlauf drücken und prüfen, ob einwandfreier manueller Suchlauf mit niedriger und hoher Geschwindigkeit möglich ist (in Vorwärts- und Rückwärtsrichtung).

Prüfen auf Defekte

1. Die Testplatte (SZZP1054C) abspielen.
2. Die **Spur Nr. 6 (Keil 0,7 mm)** wiedergeben und prüfen, daß kein Tonausfall oder Rauschen auftritt.
3. Die **Spur Nr. 13 (schwarzer Punkt 0,7 mm)** wiedergeben und prüfen, daß ein Tonausfall oder Rauschen auftritt.

JUSTIERUNG DES OPTISCHEN ABTASTERS

Meßinstrumente und Spezialwerkzeuge

- Zweikanal-Oszilloskop (mit Trigger) von 30 MHz oder mehr
- Testplatten
  Testplatte (SZZP1014F) alter oder neuer Typ
  Inspektions-Testplatte (SZZP1054C)
  Ungleichmäßige Platte (SZZP1056C)
- Sechskantschlüssel (SZZP1044C...1,5 mm)
- Sechskantschlüssel (1,27 mm)
- Fühlerlehre (RZZ0297)
- Filter
- Schrauben-Versiegelungsfarbe (RZZ0L01)

Justierverfahren

- Wenn der optische Abtaster und der Spindelmotor ausgetauscht werden, die Justierung nach dem folgenden Verfahren durchführen.

Schritt 1: Die einzelnen Regelwiderstände provisorisch justieren.
↓
Schritt 2: Plattentellerhöhe-Justierung
↓
Schritt 3: Mechanische Justierung
↓
Schritt 4: Elektrische Justierung

PLATTENTELLERHÖHE-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ102** (+) und **TJ302** (−) der Hauptplatine durch das Filter anschließen.
   Oszilloskop-Einstellung:
   VOLT .....50 mV
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
2. Das Oszilloskop auf Gleichstrom-Nullbalance einstellen.
3. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
4. Den Spieler auf Wiedergabe schalten.
5. Den auf dem Oszilloskop angezeigten Gleichstrompegel (A mV) messen.
   Wenn der Wert von A under ±**60 mV** liegt, ist die Plattentellerhöhe korrekt. Wenn er nicht in diesem Bereich liegt, die erforderlichen Justierungen unter Verwendung der 0,9 mm Fühlerlehre (RZZ0297) durchführen. Wenn A mehr als +**60 mV** beträgt, den Plattenteller absenken. Wenn A weniger als −**60 mV** beträgt, den Plattenteller anheben.

Die Plattentellerhöhe wie folgt justieren:

A. Die 0,9 mm Fühlerlehre (RZZ0297) wie unten gezeigt einführen.
B. Die Plattenteller-Stellschraube lösen.
C. Die Plattentellerhöhe durch geringfügiges Bewegen der Fühlerlehre in die entsprechende Richtung justieren.
D. Die Plattenteller-Stellschraube mit dem 1,27 mm Sechskantschlüssel anziehen.
E. Die Plattentellerhöhe-Justierung nach den obigen Schritten 1~5 überprüfen.

MECHANISCHE JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV
   KIPP .....0,5 μsec.
   EINGANG .....Wechselstrom
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1056C) einsetzen.
3. Mit den Tasten für manuellen Suchlauf den Abtaster so positionieren, daß die Schrauben für mechanische Justierung mit den Justieröffnungen in der Bodenplatte ausgerichtet sind.
4. Unter Beobachtung des HF-Signals auf dem Oszilloskop die **beiden Justierschrauben** abwechselnd mit dem 1,5 mm Sechskantschlüssel (SZZP1044C) so einstellen, daß die vertikalen Schwankungen des HF-Signals minimal und das Augenmuster am weitesten gestreckt wird.
5. Den Netzschalter des Spielers ausschalten.
6. Nach der Justierung **Schrauben-Versiegelungsfarbe** (RZZ0L01) auf die Justierschrauben auftragen.

FRANÇAIS

REGLAGES ELECTRIQUES

Appareils de mesure et outillage spécial

- Boîte de réglage du gain de la boucle d'asservissement (SZZP1017F)
- Disques d'essai
  Disque d'essai (SZZP1014F) nouveau ou ancien modèle
  Disque de vérification (SZZP1054C)
  Disque voilé (SZZP1056C)
  Disque à bande noire (SZZP1057C)
- Disque ordinaire
- Oscilloscope double track à déclenchement, 30 MHz (ou mieux)
- Générateur basse fréquence
- Adaptateur (SZZP1032F)

Procédure de réglage

1ère étape: Retirer le coffret.

2ème étape: Procéder au réglage préliminaire de chaque résistance variable.

3ème étape: Réglage visuel (Equilibrage du photodétecteur)

4ème étape: Brancher la boîte de réglage du gain de la boucle d'asservissement.

5ème étape: Réglage du gain de focalisation.

6ème étape: Réglage du gain de poursuite.

7ème étape: Réglage de l'erreur de focalisation.

8ème étape: Réglage de l'erreur de poursuite.

9ème étape: Réglage de l'équilibrage de l'erreur de poursuite.

10ème étape: Débrancher la boîte de réglage du gain de la boucle d'asservissement.

11ème étape: Réglage de la boucle de calage en phase (PLL).

12ème étape: Vérification du fonctionnement après réglages.

Réglage préliminaire de chaque résistance variable

Remarque:
Si la lecture du disque est impossible ou que des sauts de portions enregistrées apparaissent, procéder au réglage de chaque résistance variable comme il est indiqué ci-après.

REGLAGE VISUEL (EQUILIBRAGE DU PHOTO-DETECTEUR)

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV
   BALAYAGE ....0,5 μs
   ENTREE .....CA
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
3. Procéder à la lecture du disque.
4. Régler **VR101** de sorte que la figure du signal radiofréquence soit aussi étirée que possible.
5. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.

REGLAGE DU GAIN DE FOCALISATION

1. Brancher la boîte de réglage du gain de la boucle d'asservissement.
2. Placer le commutateur de cette boîte sur la position **2** et l'interrupteur d'alimentation sur la position **ON**.
3. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **750 Hz** avec une amplitude de **100 mV crête à crête**. Brancher ce générateur entre les bornes **OSC** (+) et **GND** (−) de la boîte de réglage.
4. Relier les entrées (CH1 et CH2) de l'oscilloscope aux bornes **TP1** et **TP2** de la boîte de réglage. (**TP3** est la borne de masse.)
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....1 ms
   ENTREE CC
5. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
6. Procéder à la lecture du disque.
7. Basculer le commutateur de la boîte de réglage de la position **2** à la position **3**.
8. Deux traces du signal à **750 Hz** apparaissent sur l'écran de l'oscilloscope. Régler **VR104** de sorte que les amplitudes des deux traces soient identiques.
9. Basculer le commutateur de la boîte de réglage de la position **3** à la position **2**.

REGLAGE DU GAIN DE POURSUITE

1. Les raccordements et les réglages de l'oscilloscope sont identiques à ceux du réglage précédent.
2. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1,0 kHz** avec une amplitude de **100 mV crête à crête**.
3. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1**.
4. Deux traces du signal à **1,0 kHz** apparaissent sur l'écran de l'oscilloscope. Régler **VR102** de sorte que les amplitudes des deux traces soient identiques.
5. Basculer le commutateur de la boîte de réglage de la position **1** à la position **2**.
6. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.

REGLAGE DE L'ERREUR DE FOCALISATION

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Relier l'entrée 2 (CH2) de l'oscilloscope aux bornes **TJ102** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....0,5 ms
   ENTREE .....CA (CH1), CC (CH2)
   MODE .....NORM (le déclenchement est commandé par CH1)
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1057C).
3. Procéder à la lecture du disque.
4. Observer les deux traces et régler **VR105** de sorte que l'allure des courbes au voisinage du point de déclenchement soit celle de l'illustration.

REGLAGE DE L'ERREUR DE POURSUITE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Relier l'entrée 2 (CH2) de l'oscilloscope aux bornes **TJ101** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....0,5 ms
   ENTREE .....CA (CH1), CC (CH2)
   MODE .....NORM (le déclenchement est commandé par CH1)
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disque d'essai (SZZP1057C).
3. Procéder à la lecture du disque.
4. Observer les deux traces et régler **VR103** de sorte que l'allure des courbes au voisinage du point de déclenchement soit celle de l'illustration.

REGLAGE DE L'EQUILIBRE DE L'ERREUR DE POURSUITE

1. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1 kHz** avec une amplitude de **200 mV crête à crête**. Brancher ce générateur entre les bornes **OSC** (+) et **GND** (−) de la boîte de réglage.
2. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV
   BALAYAGE ....0,5 ms
   ENTREE .....CA
3. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
4. Procéder à la lecture du disque.
5. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1**.
6. Régler **VR106** de sorte que l'allure du signal soit celle de l'illustration (l'instabilité de phase est minimale).
7. Basculer le commutateur de la boîte de réglage de la position **1** à la position **2**.
8. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.
9. Débrancher la boîte de réglage et replacer le connecteur de court-circuit de CN102 dans la position d'origine.

REGLAGE DE LA BOUCLE DE CALAGE EN PHASE

1. Brancher l'entrée (CH1) de l'oscilloscope entre la borne de sorte ligne **(LINE OUT)** de la voie droite ou gauche et la **masse**.
   Réglages de l'oscilloscope:
   TENSION .....1 V
   BALAYAGE ....1 ms
   ENTREE CC
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1054C).
3. Lire la **plage No. 6** du disque **(coin 0,7 mm)**.
4. Observer l'allure du signal sur l'oscilloscope et régler **VR501** de la manière suivante:
   1ère étape: Tourner **VR501** doucement dans le sens des aiguilles d'une montre et noter le moment où le signal commence à être perturbé.
   2ème étape: Tourner **VR501** doucement dans le sens contraire des aiguilles d'une montre et noter le moment où le signal commence à être perturbé.
   3ème étape: Régler **VR501** au milieu des deux positions notées au cours des opérations **1** et **2** ci-dessus.

VERIFICATION DU FONCTIONNEMENT APRES REGLAGES

Vérification du saut de plage

1. Lire un disque ordinaire.
2. Appuyer sur la touche de commande de saut de plage et s'assurer que le fonctionnement est correct dans les deux sens.

Vérification de la recherche manuelle

1. Lire un disque ordinaire.
2. Appuyer sur la touche de recherche manuelle et s'assurer que le fonctionnement s'effectue sans à-coups dans les deux vitesses possibles.

Vérification de la lecture

1. Mettre en place un des disques d'essai (SZZP1054C).
2. Lire la **plage No. 6 (coin 0,7 mm)** et s'assurer qu'il n'y a ni bruit ni perte de signal.
3. Lire la **plage No. 13 (point noir 0,7 mm)** et s'assurer qu'il n'y a ni bruit ni perte d'information.

REGLAGE DU CAPTEUR OPTIQUE

Appareils de mesure et outillage spécial

- Oscilloscope double trace à déclenchement, 30 MHz (ou mieux)
- Disques d'essai
  Disque d'essai (SZZP1014F) nouveau modèle ou ancien modèle
  Disque de vérification (SZZP1054C)
  Disque voilé (SZZP1056C)
- Clé hexagonale (SZZP1044C...1,5 mm)
- Clé hexagonale (1,27 mm)
- Jauge d'épaisseur (RZZ0297)
- Filtre
- Vernis de blocage (RZZ0L01)

Procédure de réglage

- Si le capteur optique ou le circuit imprimé du moteur de rotation sont remplacés, procéder aux réglages en suivant la procédure décrite ci-dessous.

1ère étape: Procéder au réglage préliminaire de chaque résistance variable.

2ème étape: Réglage de la hauteur de la platine.

3ème étape: Réglage mécanique.

4ème étape: Réglage électrique.

REGLAGE DE LA HAUTEUR DE LA PLATINE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ102** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....50 mV
   BALAYAGE ....1 ms
   ENTREE CC
2. Régler l'oscilloscope de sorte que la trace soit au centre lorsque l'entrée est égale à 0 V.
3. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
4. Procéder à la lecture du disque.
5. Mesurer la tension continue (A mV) du signal apparaissant sur l'oscilloscope.
   Si la valeur A est à l'intérieur de la fourchette **±60 mV**, la hauteur de la platine est correcte. Dans la cas contraire, procéder aux réglages requis en employant la jauge de profondeur (RZZ0297). Si A est supérieure à **+60 mV**, diminuer la hauteur de la platine. Si A est inférieure à **−60 mV**, augmenter la hauteur de la platine.

Réglage de la hauteur de la platine:

A. Introudiure la jauge de 0,9 mm (RZZ0297) comme il est indiqué ci-dessous.
B. Dévisser la vis de positionnement de la platine.
C. Régler la hauteur de la platine en déplaçant légèrement la jauge dans la direction voulue.
D. Resserrer la vis de positionnement au moyen de la clé de 1,27 mm.
E. Vérifier la hauteur de la platine en procédant aux opérations 1 à 5 décrites ci-dessus.

REGLAGE MECANIQUE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV
   BALAYAGE ....0,5 μs
   ENTREE .....CA
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1056C).
3. A l'aide des touches de recherche, déplacer le capteur de telle manière que les vis de réglage mécanique apparaissent à travers les trous pratiqués sur le fond de l'appareil.
4. Observer l'allure du signal radiofréquence sur l'oscilloscope et agir alternativement sur les **deux vis** à l'aide de la clé hexagonale (SZZP1044C) de sorte que la fluctuation verticale des courbes soit minimale et que leur forme soit aussi étirée que possible.
5. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.
6. Le réglage terminé, appliquer une **goutte de vernis de blocage** (RZZ0L01) sur la vis de réglage.

ESPAÑOL

AJUSTE ELECTRICO

Instrumentos de medición y herramientas especiales

- Ajustador de servoganancia (SZZP1017F)
- Discos de prueba
  Disco de prueba (SZZP1014F) tipo antiguo o nuevo
  Disco de prueba de inspección (SZZP1054C)
  Disco desparejo (SZZP1056C)
  Disco de banda negra (SZZP1057C)
- Disco común
- Osciloscopio de dos canales (con disparador) de 30 MHz o más
- Oscilador de baja frecuencia
- Conector de conversión (SZZP1032F)

Procedimiento de ajuste

Paso 1: Saque el mueble.

Paso 2: Realice el ajuste temporario de cada VR.

Paso 3: Ajuste visual óptimo (equilibrio de PD [diferencia de potencia]).

Paso 4: Conecte el ajustador de servoganancia.

Paso 5: Ajuste la ganancia de enfoque.

Paso 6: Ajuste la ganancia de seguimiento.

Paso 7: Ajuste la desviación de enfoque.

Paso 8: Ajuste la desviación de seguimiento.

Paso 9: Ajuste el balance de desviación.

Paso 10: Desconecte el ajustador de servoganancia.

Paso 11: Ajuste el PLL (Bucle de enganche de fase).

Paso 12: Compruebe el funcionamiento después del ajuste.

AJUSTE TEMPORARIO DE CADA VR

Nota:
Si el disco salta o no puede reproducirse, ajuste temporariamente cada VR como se muestra.

AJUSTE VISUAL OPTIMO (EQUILIBRIO DE PD)

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. (tablero de circuitos impresos) principal.
   Puesta de osciloscopio: VOLT .....200 mV
   Barrido .....0,5 μseg.
   Entrada .....CA
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Ajuste **VR101** de modo que el patrón visual de la señal de RF se ensanche al máximo.
5. Ponga el interruptor de alimentación del reproductor en la posición **OFF**.

AJUSTE DE LA GANANCIA DE ENFOQUE

1. Conecte el ajustador de servoganancia.
2. Ponga el conmutador selector del ajustador de servoganancia en **2** y el interruptor ON-OFF en **ON**.
3. Ajuste el oscilador de baja frecuencia a la frecuencia de **750 Hz** y voltaje de salida a **100 mVp-p**. Luego conecte el oscilador a los terminales **OSC** (+) y **GND** (−) del ajustador de servoganancia.
4. Conecte CH1 y CH2 del osciloscopio a **TP1** y **TP2** del ajustador de servoganancia (**TP3** es el terminal de puesta a tierra).
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   BARRIDO .....1 mseg.
   ENTRADA.....CC
5. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
6. Ponga el reproductor en la modalidad de reproducción.
7. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"3"**.
8. En el osciloscopio se visualizarán señales de **750 Hz**. Ajuste **VR104** hasta que las amplitudes de la forma de onda de ambos canales sean iguales.
9. Cambie el conmutador selector del ajustador de servoganancia de **"3"** a **"2"**.

AJUSTE DE LA GANANCIA DE SEGUIMIENTO

1. La puesta del osciloscopio y las conexiones son las mismas que las indicadas anteriormente.
2. Ponga el oscilador de baja frecuencia a **1,0 kHz** y voltaje de salida de **100 mVp-p**.
3. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"1"**.
4. En el osciloscopio se visualizarán señales de **1,0 kHz**. Ajuste **VR102** hasta que las amplitudes de la forma de onda de ambos canales sean iguales.
5. Cambie el conmutador selector del ajustador de servoganancia de **"1"** a **"2"**.
6. Ponga en **OFF** el interruptor de alimentación del reproductor.

AJUSTE DE LA DESVIACION DE ENFOQUE

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Conecte CH2 del osciloscopio a **TJ102** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   Barrido.....0.5 mseg.
   Entrada .....CA (CH1), CC (CH2)
   Modalidad.....NORM (Disparo vía CH1)
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1057C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Verifique la forma de onda de CH1 y CH2 en el osciloscopio, y ajuste **VR105** de modo que la forma de onda alrededor del punto de disparo sea como la que se muestra en la figura.

AJUSTE DE LA DESVIACION DE SEGUIMIENTO

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Conecte CH2 del osciloscopio a **TJ101** (+) y **TJ302** (−) del P.C.B. principal
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   Barrido.....0,5 mseg.
   Entrada .....CA (CH1), CC (CH2)
   Modalidad.....NORM (Disparo vía CH1)
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1057C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Verifique la forma de onda de CH1 y CH2 en el osciloscopio y ajuste **VR103** de modo que la forma de onda alrededor del punto de disparo sea como la que se muestra en la figura.

AJUSTE DEL EQUILIBRIO DE DESVIACION DEL SEGUIMIENTO

1. Ajuste el oscilador de baja frecuencia a la frecuencia de **1 kHz** y voltaje de salida de **200 mVp-p**. Luego conecte el oscilador a los terminales **OSC** (+) y **GND** (−) del ajustador de servoganancia.
2. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio: VOLT .....200 mV
   Barrido .....0,5 mseg.
   Entrada .....CA
3. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
4. Ponga el reproductor en la modalidad de reproducción.
5. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"1"**.
6. Ajuste **VR106** de modo que la forma de onda de la salida sea como se muestra (la fluctuación se hace mínima).
7. Lleve el conmutador selector del ajustador de servoganancia de **"1"** a **"2"**.
8. Ponga en **OFF** el interruptor de alimentación del reproductor.
9. Desconecte el ajustador de servoganancia e inserte el conector de cortocircuito de CN102 en la posición original.

AJUSTE DEL PLL (BUCLE DE ENGANCHE DE FASE)

1. Conecte CH1 del osciloscopio al **terminal LINE OUT** (del canal L o del R) y a **tierra**.
   Puesta de osciloscopio: VOLT .....1 V
   Barrido .....1 mseg.
   Entrada CC
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1054C).
3. Reproduzca el **surco No. 6 (cuña de 0,7 mm)** del disco de prueba.
4. Verifique la forma de onda que se visualiza en el osciloscopio y ajuste **VR501** de acuerdo con los siguientes pasos.
   Paso 1. Gire lentamente **VR501** en el sentido de las manecillas del reloj y observe el punto en el que la forma de onda del osciloscopio comienza a deformarse.
   Paso 2. Gire lentamente **VR501** en el sentido contrario a las manecillas del reloj y observe el punto en que la forma de la onda del osciloscopio comienza a deformarse.
   Paso 3. Fije **VR501** en la posición intermedia entre los puntos observados en los pasos anteriores **"1"** y **"2"**.

COMPROBACION DEL FUNCIONAMIENTO DE REPRODUCCION DESPUES DEL AJUSTE

Comprobación de exploración de salto

1. Reproduzca un disco común.
2. Pulse el botón de salto para comprobar la exploración de salto (tanto en la modalidad directa como en la inversa).

Comprobación de exploración manual

1. Reproduzca un disco común.
2. Pulse el botón de exploración manual para comprobar si la exploración manual se puede realizar suavemente a velocidades bajas y altas (tanto en la modalidad directa como en la inversa).

Comprobación de reproducibilidad

1. Reproduzca el disco de prueba (SZZP1054C).
2. Reproduzca el **surco No. 6 (cuña de 0,7 mm)** y verifique si no hay salto de sonido o ruido.
3. Reproduzca el **surco No. 13 (punto negro de 0,7 mm)** y verifique si no hay salto de sonido o ruido.

AJUSTE DE LA TOMA OPTICA

Instrumentos de medición y herramientas especiales

- Osciloscopio de dos canales (con disparador) de 30 MHz o más
- Discos de prueba
  Disco de prueba (SZZP1014F) tipo antiguo o nuevo
  Disco de prueba de inspección (SZZP1054C)
  Disco desparejo (SZZP1056C)
- Llave de tuercas hexagonal (SZZP1044C...1,5 mm)
- Llave de tuercas hexagonal (1,27 mm)
- Calibre de espesor (RZZ0297)
- Filtro
- Adherencia de cierre de tornillo (RZZ0L01)

Procedimiento de ajuste

- Si se cambia la toma óptica y el motor del eje, ajústelos de acuerdo con el siguiente procedimiento.

Paso 1: Ajustar temporariamente cada VR.
↓
Paso 2: Ajuste la altura del plato giradiscos.
↓
Paso 3: Ajuste mecánico.
↓
Paso 4: Ajuste eléctrico.

AJUSTE DE LA ALTURA DEL PLATO GIRADISCOS

1. Conecte CH1 del osciloscopio a **TJ102** (+) y **TJ302** (−) del P.C.B. principal a través del filtro.
   Puesta de osciloscopio: VOLT .....50 mV
   Barrido .....1 mseg.
   Entrada CC
2. Ajuste el equilibrio cero de CC del osciloscopio.
3. Lleve el interruptor de alimentación del reproductor a **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
4. Ponga el reproductor en la modalidad de reproducción.
5. Mida el nivel de CC (AmV) que se visualiza en el osciloscopio.
   Si el valor de A está dentro de la gama de ±**60 mV**, la altura del plato giradiscos es correcta. Si no está dentro de esta gama, realice los ajustes necesarios utilizando el calibre de espesor (RZZ0297). Si A es mayor que +**60 mV**, baje el plato giradiscos. Si A es menor que −**60 mV**, levante el plato giradiscos.

Ajuste la altura del plato giradiscos de la siguiente forma:

A. Inserte el calibre de espesor de 0,9 mm (RZZ0297), como se muestra abajo.
B. Afloje el tornillo de ajuste del plato giradiscos.
C. Ajuste la altura del plato giradiscos moviendo el calibre levemente en la dirección apropiada.
D. Apriete el tornillo de ajuste del plato giradiscos usando la llave de tuerca hexagonal de 1,27 mm.
E. Compruebe el ajuste de la altura del plato giradiscos siguiendo los pasos 1~5 anteriores.

AJUSTE MECANICO

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio: VOLT .....200 mV
   Barrido .....0,5 μseg.
   Entrada .....CA
2. Lleve el interruptor de alimentación del reproductor a **ON** e inserte el disco de prueba (SZZP1056C).
3. Utilizando los botones de exploración manual, mueva la toma de modo que los tornillos de ajuste mecánico se alineen con los orificios de ajuste del panel inferior.
4. Mientras comprueba la señal de RF del osciloscopio, apriete los **dos tornillos de ajuste** alternativamente con la llave hexagonal de 1,5 mm (SZZP1044C) de modo que la fluctuación vertical de la señal de RF se haga mínima y que el patrón visual se ensanche al máximo.
5. Lleve el interruptor de alimentación del reproductor a **OFF**.
6. Después del ajuste, aplique **adherencia de cierre de tornillo** (RZZ0L01) a los tornillos de ajuste.

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